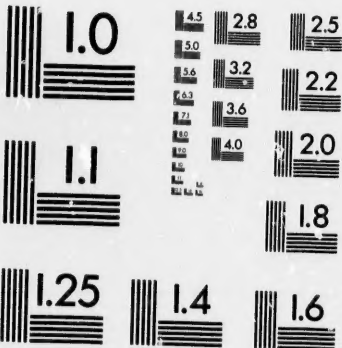


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*A Book
for Farmers.*

Issued by

THE NOR'-WEST FARMER,

WINNIPEG, MANITOBA.

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THINGS WORTH KNOWING

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Winnipeg, Man.



WINNIPEG:
The Stovel Co., Printers.
1900

63.11.19/10

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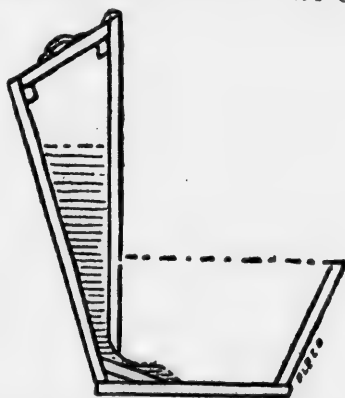
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LIVE STOCK.

Feed Box for Greedy Horses.

Some horses get into the habit of eating their grain so rapidly that a large portion of it passes into the stomach without being ground. The strong digestive fluids make but little impression on the hulls of oats, so that not only is the food wasted, but indigestion and colic are very apt to follow. Grinding the grain sometimes cures a greedy eater, and putting a few fair-sized stones in the feed causes the horses to eat more slowly and carefully. There is nothing equal to a self-feeding box for curing greedy eaters. The accompanying cut, taken from Brett's Colonial Guide,



gives an idea of how the box is made. The opening at the bottom should not be more than one-quarter of an inch in depth and extends along the full length of the feed box or as long as desired. The bevelled board at the bottom helps throw the grain out. The advantage of this plan is that the horse must eat slowly.

Don't get the idea that you know it all and that you will not see improvements in your neighbor's method. Remember this is an age of progress and discovery. No one man has all the good things, nor a patent right on producing them. What one man has done another man may do.

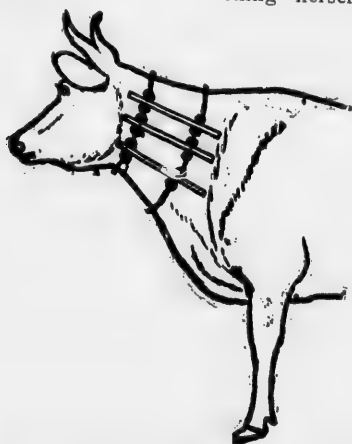
To Prevent an Amina! Sucking.

This formidable nose-ring is said to effectually prevent a calf sucking a cow or a cow sucking herself. It is made of 5-16 round iron, flattened where the two pieces cross each other. The spike is rivetted in one set of holes and after



the ring has been placed in the nostrils the little bolt is put in the other holes. Part 3 shows the spike and the bolt. One or the other of the three points is sure to prick the cow which an animal wearing it tries to suck.

A Franklin farmer has found the following device successful in preventing a cow sucking herself:—"Securing



two lengths of small cord, also six pieces of round light wood about 12 inches long and $1\frac{1}{4}$ inches in diameter, I

bored $\frac{1}{4}$ inch holes at each end of the sticks, then having tied a knot at one end of the rope, I threaded on the sticks. Not having shorter pieces of wood, I bored through the centre lengthwise to thread between the longer sticks. I knotted the cord on either side of the sticks, then throwing the same across the cow's neck (having regulated the knots and sticks to suit the small of the neck and also the shoulder), I tied the end of the cords around the first knot. The accompanying illustration shows the result. This device prevents the cow from reaching her flanks and in my case has stopped the failing and will save quite a few pounds of butter. I send it to you thinking it may be useful to others in like circumstances."

Warbles In Cattle—Prevention and Cure.

A stockman says he has for many years been quite successful in killing warbles on the backs of his cattle by washing them with strong salt brine in February and March. The effect of the washing is to shrivel up the grub so that it comes out, looking a good deal like a small thorn and leaving no irritation of the skin after the application. He also says that if the cattle be thoroughly brined in the same way about the middle of June (that being the time when the eggs are laid), there will be no warbles in the cattle the following spring. The use of coal oil emulsion, sprayed on the cattle when the fly lays the egg, is also recommended.

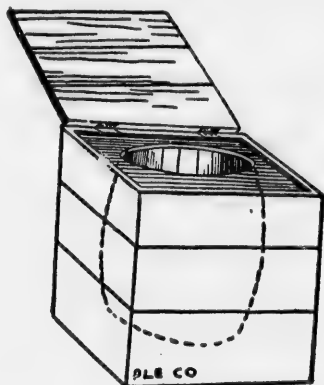
Draw Out the Horse's Mane.

In hitching your horse always be sure and slip the collar back upon the neck into the proper place, and then carefully draw the mane out from under it. It is surprising how many farmers, who have worked horses all their lives, neglect this. The result is a pulling out of the mane, and, very frequently, sore shoulders. A horse can no more work comfortably with his mane lying under the collar, than a man can walk easily with the ends of his shoe laces under the soles of his feet.

Musty feed of any kind, whether oats or hay is very bad for horses. It not only has a bad effect upon the digestive organs, but in some cases acts injuriously upon the kidneys, producing a condition known as diabetes. To assist in restoring a healthy state of the stomach, etc., give in each feed to each horse one tablespoonful of the following powder:—Sulphate of soda, two lbs.; bicarbonate of soda, half a lb.; powdered ginger and powdered anise, of each two ounces.

Handy Feed Cookers.

Sometimes it is desirable to feed soaked feed to pigs or to keep feed warm for a time. The first illustration shows a contrivance that some men have found very handy. It is a good, sound barrel packed inside a large packing box. Secure a packing box about 16 or 20 inches wider than the widest diameter of the barrel. Pack and pound 6 or 8 inches of chaff or cut straw in the bottom of the box, set the barrel on this and pound in the chaff around the sides; have the top of the box come some three or four inches above the barrel, so that a double cover may be put on. The sides of the box can be built up, if necessary, and a step made on the outside, so that one can reach into the barrel with ease. The top may be hinged or loose. If you haven't a regular boiler house, such a contrivance will be found a first-rate thing into which to put a lot of bran or meal, and then put on enough boiling water to wet it tho-

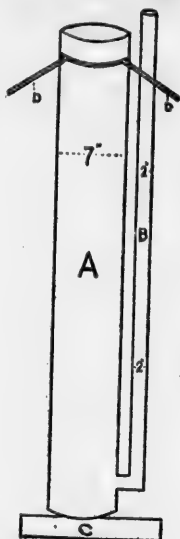


roughly, cover up and let stand. It will cook in a few hours. If prepared the last thing at night it will be ready to feed in the morning, if the box is kept in the stable, or back kitchen. If the barrel is too large, use only a half one.

Another cooker can be made as follows: Instead of a barrel a large galvanized iron pail, with flaring sides, is used. Set it in a box with a good layer of cut straw in the bottom; then pack around it a good thickness of long straw. When the straw is firmly packed the pail will lift out and can be carried to the stable. Have a double cover for it. It will be found handy for preparing a morning mash for the hens' breakfast. Mix the meal in the evening; the last thing at night put on enough boiling water, cover up, and by morning it will be nicely cooked ready to go to the stable the first thing. The hens will appreciate it.

O. E. Reilly, Neepawa, is the possessor of a feed cooker that for simplicity and cheapness is hard to beat. Owing to its useful nature we publish drawings of the contrivance. This cooker boils two bags of feed in from 1½ to 2 hours.

It consists of simply a coal oil barrel, into which is inserted the heating apparatus. In operation the heater is first inserted into the barrel, the feed to be cooked is then poured in and the barrel filled to the top with water. Then light your fire, putting it down the pipe, and after a few minutes' attention all the work necessary is done, and all that remains



A—Rivetted iron pipe, 7 inches in diameter.

B—Tin pipe conducting air to fire, 2 inches in diameter.

C—Iron plate to keep heater off bottom of barrel.

D—Iron rods to hold heater solid while in barrel.



when the feed is cooked is to remove the heater and the grain will have swelled up enough to take its place, leaving a barrel full of feed. The heater proper cost Mr. Reilly but \$1.50, and was made in town for that price.

As a precautionary measure, the smoke piping should always be provided with a fine screen or other adequate spark-arrester. Where the piping is carried into a chimney, or outside, a large slide door in the side of the pipe could be used for putting in fuel.

Fitting Collars.

A correspondent gives the following plan of fitting a collar to a horse's shoulder that will ensure perfect fit and freedom from sores:—

Put the collars into a tub of hot water at night and let them stay until morning. Then take them out and put them on the horses, buckle on the harness solid, and work the horses hard all day. At night the collars will be dry and exactly fit the shoulder. Never change a collar once it is fitted.

Milk Strains Among Hogs.

Too little attention has been paid by breeders and farmers to the milking qualities of their brood sows, and yet of all things to be taken into consideration in selecting broods sows this characteristic is the most important. Maternity is the function of a brood sow, and failing in good milking capacity, she fails to fulfil this function. Did you ever note that the sow that is the kindest, most careful mother, is always the one that gives the biggest flow of milk, and the sow that gives frequently, and she most gladly responds to the call of the little fellows for a lunch as often as they want it. She is careful and grateful to them for the relief they give her. The other sow finds no such comfort from her litter, since she has no need for that kind of relief; on the contrary, the frequent demands of the half-starved pigs are unpleasant to her. She becomes irritable and cross at their persistent calls for more. She would rather be let alone, go off by herself, eat her fill and lie down undisturbed while she converts it into pork on her own back instead of on that of her pigs. So, at weaning time, you will find her in pretty good shape, while the pigs are all runts. But the other sow and her litter, how do they look? Just the reverse.

The United States raise about 56 per cent. of all the hogs in the world. The statistical report shows over 122,000,000 in the world, of which the States produce 69,000,000.

The hog is the most economical vehicle yet produced in which to carry the products of the farm to market in a condensed form and at the same time yield the producer a profit above the price such grain thus fed would sell for in the open market.

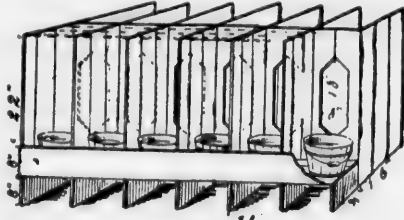
It is a well-known fact that pigs are very fond of charcoal, especially while fattening, and experiment has shown that they make more rapid gains if they have access to it. Half-burnt wood out of a stove, if not given till it is safe from danger of setting fire to the bedding, is charred enough.

Keep a record book of the time your sows come in heat. As they come in heat every three weeks, or twenty-one days, you will know then when to expect them, a second time, if you do not wish to breed them when in heat the first time. It pays to keep a memorandum book and enter in it. Don't trust your memory. Be positive.

In selecting our sows we always choose one with the greatest number of teats, say 12 to 14, and one possessing a long, round body, a short head, small ears and large bone. We do not care how big they are so they do not run to legs. In selecting a male pig for a breeder we follow the same idea and find it proves good. We also look closely to the hair of a hog. We want a good, fine, sleek coat, but a rough coat will not prevent us from using a pig of either sex if it fills all the other points.—Points from a Breeder's Experience.

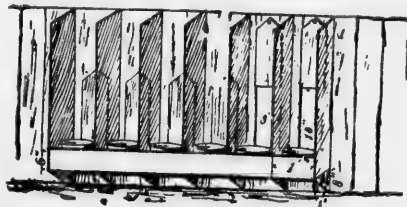
Calf Feeding Devices.

Where a number of calves are running together in a pen or paddock it is always a difficult and trying job to feed one calf alone. The accompanying illustrations show how this difficulty can be avoided. The first illustration shows a calf feeding manger that some have permanently built into the side of their calf pen.



Arrangement for the Calf Pen.

It is 38 inches high, with a shelf for the pails eight inches from the ground and a board in front to keep the pails in place. The shelf for the pail is about a foot wide. On the inner side next the calf a partition runs through from end to end and in it openings are made just large enough for the calf's head to go through and reach the pail. Cross partitions divide it into spaces 14 inches wide and extend 18 inches to the rear. Only one calf can get in each place, then, by having a short piece of rope or a chain with a snap and ring on it fastened to the partition, each calf can be tied and kept there as long as wanted. It is especially designed to prevent calves learning to suck one another after having gulped down their milk. The wide partitions and narrow openings for the head prevent them reaching each other. As soon as they will lick meal, it can be put in the bottom of the pail. Each calf can get its proper share and the chewing of the meal will satisfy the craving that causes them to suck each other.



Partitions Built on Inside of Paddock Fence.

The next illustration is of a more simple feeding manger, being really only a shelf with divisions fixed on one side of a fence or other convenient place in the pasture or pad-

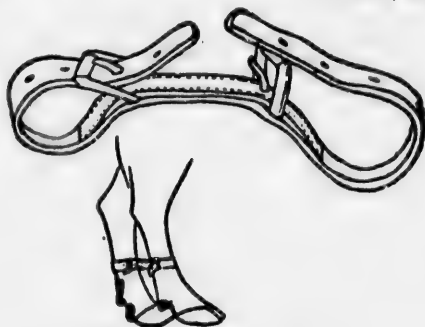
dock. Slide doors prevent the calves from getting at the pails until all are put in place, then the doors can be drawn up and fastened with a pin. The openings should be made about eight inches wide. If this is found too large a piece of board fixed on the side away from the slide will make it narrow enough to suit. Such a feeding device will save work and curse words, as well as the hungry calves' heads and eyes.

To Prevent a Cow Kicking.

Contrivances for this purpose are numerous and nearly every farmer has some simple restraint which experience has shown him is sufficient—a rope or chain drawn tightly around the body in front of the udder, a rope tied tightly around the hamstrings, or perhaps crowding the cow to one side of the stall with a pole, have been all that was needed.

Where more severe restraint is needed the following device will be found effectual:—

The first time this device is used on a cow, she will strive to lift one foot and then the other, straight upward, in rapid succession, at the same time stepping backward until she reaches the length of her halter. After a short struggle, in which she will neither throw nor strain herself, she will give



Kicking Strap for a Cow.

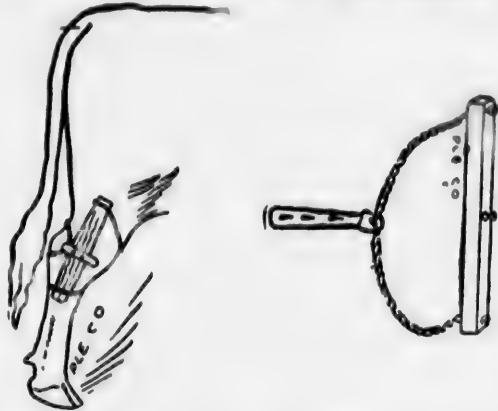
up, and unless the provocation is great, cannot be induced to move a foot while the strap remains upon her. The strap should be an inch and a quarter or an inch and a half wide, and two feet long, with two buckles placed midway of the same, and four inches apart. It should buckle and unbuckle easily.

The following is, however, one of the most simple restraints used and should be ready in every stable:—

Take a piece of oak or other strong wood, 22 inches long, $1\frac{1}{2}$ inches thick and 2 inches wide. Bore $\frac{1}{2}$ -inch holes flatwise through it, $1\frac{1}{2}$ inches from each end. Put a $1\frac{1}{2}$ -inch screw in the centre of the piece on one side, leaving a half-

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inch of the head projecting Now take a piece of $\frac{1}{4}$ -inch rope about $1\frac{1}{2}$ times as long as the stick, and passing the ends through the holes, tie knots on them. On this rope rivet a broad piece of strap about 6 inches long. Rivet it at one end, so that it will slide on the rope and in the rest of the strap cut three or four holes large enough to button



Another Simple Device—Handy to Put On.

over the head of the screw. To adjust the contrivance, place the piece of wood against the right hind leg, with the screw just over the gambrel joint, with the rope and strap to the front. Now, by putting the left hand between the legs from behind, the strap can be caught, brought round the leg and buttoned on the screw head. If the rope is about the right length the loop will just nicely slip over the corner of the elbow formed by the joint. When properly adjusted, it stiffens the cow's leg so that she cannot possibly bring her foot forward to kick. Neither can she get it off.

Ring the Bull Calves Early.

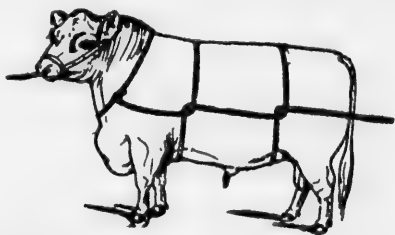
Soon after a bull calf is eight months old he begins to show some signs of belligerency. Many of them show it before they are that old and should have a ring put in their nose. When they become very obstreperous, it is a good plan to put a ring in their nose and tie them in a roomy stall by it with a short chain to the manger. The nose is more tender when they are young than when older and they soon learn to accept the inevitable and be guided by the ring. Neither is it a lesson that is as quickly forgotten. Ever after he is much more easily controlled by the ring. To avoid trouble, all bulls should have a ring put in before they are a year old. Use only a copper ring.

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How to Throw a Bull.

A good plan is as follows: Put a halter on. Take a sound $1\frac{1}{2}$ inch rope; make a loop at one end and pass it over the head and let it rest close around the neck, low down like a collar; bring the rope to the near side, pass it over the back part behind the shoulders, bring it underneath the chest, and pass it under and then above the rope so as to make a loop around the chest; carry the rope back, pass it over the loins, and bring it underneath the belly, close to the flanks; make another loop as before, and carry the rope straight behind the animal; tighten up the loops, one close to the elbows, the other close to the hind flanks.



All being ready, instruct the man who holds the halter shank to pull forwards, and, at the same time, the men who have hold of the loose end of the rope to pull straight backwards, and down the animal goes, generally without a struggle. Keep his head down and the rope firm, and as a rule the animal lies quietly until such a time as it is desired that he should get up, when the rope is slackened and up he gets, none the worse for the casting.

The heaviest bull may be cast in this way; but, of course, no one should think of casting cows in calf, either in this way or in any other. Those who have experienced trouble, in the past, in trimming their bulls' feet will greatly appreciate this method of casting for that purpose.

Hoven or Bloat in Cattle.

In severe cases, if the proper instruments are not at hand, do not hesitate to quickly plunge a knife into the rumen on the left side, half way between the last rib and the point of the hip. Turn the knife blade half way round and allow the gas to escape. As soon as the distension is reduced, give the animal one quart of raw linseed oil. Often valuable animals are lost by the ignorance and timidity of the owner. Do not anticipate any bad results to follow, but proceed fearlessly. Every stockman should have a trocar. Keep animal on light diet for a few days.

New Brand Regulations in the N.W.T.

The Brand Register for the Northwest Territories is kept by the Department of Agriculture, Regina. Below is a short synopsis of the provisions of the new Brand Ordinance which became law in 1900:—

1. Brands as Evidence of Ownership.—The presence of a brand on any animal is *prima facie* evidence of ownership.

2. Penalties.—Any person who brands or assists in branding any stock with an unrecorded brand, or who brands with his own brand any stock of which he is not the owner, without the authority of the owner, or blotches, defaces or alters any brand, renders himself liable to a penalty of \$200.

3. Cattle Brands.—(a) Cattle brands for the right or left shoulder, ribs and hip are allotted upon a system that permits of the prompt registration and issue of certificate. Cattle brands, as now allotted, uniformly consist of one carefully selected letter and one figure, with a bar, quarter circle or half diamond above or below. It is an important feature of this system that the selection of such a brand will not, under any circumstances, be in the hands of the applicant.

(b) Brands for the right or left jaw and neck of cattle may be chosen by the applicant in the manner explained in paragraph 4, dealing with "Horse Brands."

All applications for cattle brands should distinctly state the position on the animal for which the applicant desires to have the brand recorded. The fee for allotting such a brand is \$1, which should accompany all applications.

4. Horse Brands.—Any horse brand selected by the applicant (which may, of course, be a brand already registered for cattle) may be recorded, provided it is found, after a careful search, that it does not conflict with brands already recorded. The fee for such is \$1, to be sent with application. It is absolutely necessary when forwarding such an application to describe plainly the brand desired and also the position on the animal preferred. In order to save unnecessary delay and correspondence, all applications must contain a list of at least five further designs marked "second choice," "third choice," etc., so that a selection may be made from these, in the order named, in case the first choice cannot be accepted for record. It might also be mentioned that the brands consisting of arbitrary signs on the books of the Department of Agriculture are very numerous, and there is, therefore, very little chance of obtaining such; there are, however, a large number of combinations of two letters or two numerals, or one letter and one numeral, available, and these are, therefore, the safest brands to apply for, especially if time is an object in the allotment of a brand. Designs will only be selected by the Department if the applicant distinctly makes such a request.

5. Searches and Certificates.—The fee for making searches of the brand records is 25 cents for each brand. If a certi-

fied abstract from the records is required, a further fee of 25 cents is charged.

6. Changes.—Changes not conflicting with previously recorded brands, or inconsistent with the provisions of the Ordinance, may be made in any design, registered in the books of the Department, or in the position thereof on the animal. The fee for such a change is \$1.00.

7. Transfers.—Transfers in proper form of any recorded brand, new or old, will be registered, now as heretofore, for fee \$1. Transfers to one individual of any brand for horses as well as cattle, will be considered two distinct transactions. A separate form of transfer must be filed (accompanied by the prescribed fee) for the transfer of each separate brand. Transfer papers must be witnessed by a Justice of the Peace, Notary Public or Commissioner for taking Affidavits. Transfer forms may be had on application to the Department of Agriculture, Regina.

8. Vents.—No vents are being recorded in view of the fact that the Brand Ordinance provides uniform vents. The vent for any brand registered in accordance with paragraph 3 (a) of this memorandum is either a second impression thereof on the same side of the animal, or an impression of a letter or a numeral of the brand placed horizontally (laid) below the brand. The vent for any other brand, whether on horses or cattle, in the absence of any specially recorded vent, is the second impression of the brand on the same side of the animal.

Scalding Trough for Pigs.

The following instructions come from John Dash, Hillesden, Assa. :—"I use a snow melter, made as follows, of sheet iron. I made a bottomless box of 2 inch plank, 6 ft. long, 2 ft. wide and 1 ft. deep. The bottom is made of sheet iron nailed on to the frame. I build a fire place of stone the proper size, to set this pan on. At one side I build a bench level with the top of the pan. From this bench I put a pig into the pan, and take him out when scalded. The water must be deep enough in the pan to cover the pig, so that he will be scalded all over at once."

A Feeding Device for Motherless Pigs.

Many a man loses a litter of young pigs owing to some accident to the mother, and it has always been a question if some feeding device could not be invented by which the young pigs could get a supply of milk and their lives be saved. Lambs are raised by hand; why not pigs? In an American journal an account is given of how Dr. Jordan, the director of the New York Experiment Station, invented a contrivance by means of which young pigs can dispense with the services of a mother immediately after birth. A registered

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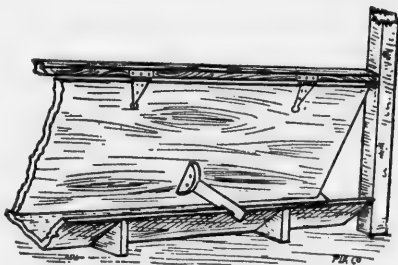
Things Worth Knowing.

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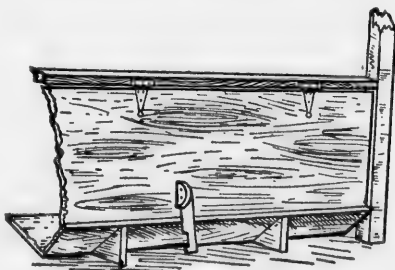
Duroc sow gave birth to a litter of pigs at the station one day recently. The mother was taken violently ill and was unable to suckle her offspring after the first day. A small tank was made which had a sufficient number of outlets at the bottom, and six inches above the floor, to allow one to each pig. A small tube of galvanized iron, covered with cork, was inserted in each of the outlets. An ordinary rubber nursing nipple was attached. When the well-filled nurse is placed in the pen the pigs greet it with squeals of delight, and appear to have the same affection for it they would have for a more animated mother.

Handy Arrangement for Pig Feeding.

There have been various schemes for arranging the feeding apparatus of pigs, but the accompanying plan, used by George Little, Neepawa, is about as good as any:—



In Position to Receive Feed—Keeping Pigs Out of Trough.



Allowing Pigs Access to Trough.

The handiness of this scheme is what recommends it. With his foot the feeder shoves the swinging partition back until it catches. After emptying the feed, he lifts the catch with his toe and the partition swings back. It is so simple that anyone can make it.

Feeding Lambs by Hand.

When a lamb has to be raised by hand it is a mistake to feed too much at a time, but hardly any mistake can be made in feeding too often. Milk from a fresh cow is better than from one that has been in milk a long time. The handiest way to give milk is from a bottle with a rubber nipple. By getting a glass Y tube and putting rubber nipples on each fork, two can be fed at once. A newly-dropped lamb only requires two teaspoonfuls at a time given every hour. It should be fed at blood heat. The lambs seem to like it warm, and for best results it should be fed warm, as that is the way they get it from their mothers. Some sheepmen think it necessary to dilute the milk with a little water and then add a little sugar. Experiments along this line show that it is not necessary. There is more to be gained by warming the milk and by regular feeding. The bottle and nipple must be kept absolutely clean and free from sour milk or the lamb will refuse it. As the lambs grow they will take more milk and can be fed less frequently. A lamb two months old should be able to take two pints of milk a day, given in two feeds. This is besides the grass eaten and any grain that may be fed.

The Brand Book for the Northwest Territories contains 10,000 different registered brands.

In 1899 there were no fewer than 11,000 horses shipped from New York to the London market.

If a young lamb is chilled, it can be warmed by dipping or holding for a short time in warm water, but care must be taken to leave some part of its head or shoulders out, so that the mother may recognize her lamb, as scent and not sight settles this important question for the first few days. If the lamb is wrapped in an old cloth, and all but the nose buried in a heating horse manure pile, it is less apt to chill afterwards and also less apt to lose the scent than if put in hot water.

When a ewe has lambed, it is always well to see that all wool and filth are cleaned away from the teats, so that the lamb has ready access to them and will not be prevented from sucking. This is especially necessary in the case with young ewes. If the lamb is not able, of its own accord, to obtain the ewe's milk, it should be assisted in doing so. Examine the udder, draw some of the milk to see that it escapes freely, and then hold the lamb so that it may reach the teat. Some shepherds recommend throwing the ewe if the lamb is too weak to stand. A better plan is to draw some of the milk and feed it from a teaspoon. If fed a teaspoonful every hour for a half day or so most weak lambs will be strong enough to get at the teat themselves. If possible, the ewe and her lamb should be kept in a pen by themselves for at least three days. It gives the lamb a chance to gain strength to run around.

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Quarantine Regulations.

The quarantine service of Canada is under the administration of the Minister of Agriculture. The stations for inspection of animals being brought into Manitoba and the Territories are Emerson, Estevan, Wood Mountain, Willow Creek, East Milk River and West Milk River. Ports at which animals coming from Europe must be landed are Charlottetown, Halifax, St. John and Quebec, and such other ports as the Minister of Agriculture may indicate.

Importing from Europe.—All animals arriving from Europe shall be subject to inspection.

Horses must be accompanied by the certificate of a qualified veterinarian and the local authority, at the time of their embarkation, that they have not been brought from a place or locality where glanders or other infectious or contagious disease was at said time in existence.

Cattle are subject to quarantine for 90 days, and all importers are obliged to certify, under oath, the locality in Europe from which animals have been brought. Cattle coming from districts in which pleuro-pneumonia is officially reported to exist are prohibited from entering Canada. All cattle must pass the tuberculin test, either before or after landing at a port of entry. The Government have appointed veterinarians in England for testing animals, and a certificate from one of these men will free an animal from undergoing the test on arrival on this side.

A quarantine of 15 days is enforced upon sheep coming from countries in which foot and mouth disease has existed during the six months preceding such importation.

A quarantine of 15 days is enforced upon swine.

Importing from United States.—All horses imported from the U. S. into Manitoba, N. W. T. and B. C. are subject to inspection at port of entry.

All cattle admitted for breeding purposes shall be accompanied by: (a) A declaration made by the importer that they are actually for breeding and no other purpose. (b) A certificate signed by a government veterinarian that they have been subjected to the tuberculin test and found free from tuberculosis. A certificate of inspection signed by a government veterinarian showing that the animals are free from contagious diseases, and that no contagious disease of cattle—except tuberculosis and actinomycosis (lump jaw)—exists in the district whence they come. When not accompanied by such certificates the animal or animals must be detained in quarantine one week and subjected to the tuberculin test.

Sheep may be admitted subject to inspection at port of entry, and must be accompanied by a certificate, signed by a government inspector that sheep scab has not existed in the district in which they have been fed for six months preceding date of importation.

Swine for breeding purposes are subjected to a quarantine of 15 days.

Fees for the inspection of animals imported from the U. S. are as follows:—

Things Worth Knowing.

Horses—For 1 horse, \$1.00; from 2 up to 10 inclusive, 75c. each; from 11 up to 20 inclusive, 50c. each; from 21 upwards, 25c. each.

Sheep and Swine—For 1 animal, 25c.; from 2 up to 5 inclusive, 10c. each; from 6 up to 10 inclusive, 6c. each; from 11 up to 20 inclusive, 4c. each; from 21 up to 50 inclusive, 2½c. each; from 51 upwards, 2c. each.

Cattle—For 1 animal, \$1.00; from 2 up to 5 inclusive, 50c. each; from 6 up to 10 inclusive, 30c. each; from 11 up to 20 inclusive, 20c. each; from 21 up to 50 inclusive, 12c. each; from 51 upwards, 10c. each.

The fees for testing cattle with tuberculin are: \$5.00 for the first animal; \$1.00 per head for the next 9 (in other words, \$14.00 for the first 10); 50c. per head for any number over 10. In every case the owner of the cattle pays cost of tuberculin, which is supplied by the Department of Agriculture at 10 cents per dose.

To Dehorn Calves.

Caustic potash will prevent the growth of the horn on calves. There is no liability to injurious results unless too much is used. On account of the non-development of the horn, calves dehorned with caustic potash grow a poll, just the same as a muley. They learn to bunt and can do great harm. For this reason many good cattle managers prefer to let the horn tissue grow until the animal is at least two years old, then remove the horns, cutting low enough to take just a little of the skin. These animals never learn to bunt. The best age at which to use the potash is when the calves are a few days to a week old. Clip off the hair over the horn button about the size of a twenty-five cent piece, moisten it a little and rub on the caustic until the horn-button is red raw. If too much moisture is applied, it will cause the caustic to run down the face, perhaps into the eye, blinding the calf.

Registrars for Pure-Bred Stock.

Henry Wade, Parliament Buildings, Toronto, Ont., is secretary of many of the Canadian records of the breeds of live stock. He registers:—

Shires, Clydesdales and Hackneys.

Shorthorns, Herefords, Ayrshires and Devons.

Nearly all the breeds of Swine, and some of Sheep.

G. W. Clemons, St. George, Ont., is secretary and registrar of the Canadian Holstein-Friesian Association.

Reduced Freight Rates for Pure-Bred Stock.

Effective May 9th, 1900.

By special arrangements with the breeders' associations shipments of pure bred stock for breeding purposes, in less than car load lots, are carried between stations in Manitoba, Assiniboia, Alberta, Saskatchewan and British Columbia, at one-half the regular tariff rates at the following weights by the Canadian Pacific Railway and its branches, and the Canadian Northern Railway.

The Northern Pacific Railway have not issued instructions to their agents to accept pure-bred stock at reduced rates, but shippers can obtain these reduced rates by making application to the Superintendent through the station agent:

Calves—

Under six months	500 lbs.
Over six months and under one year	1,000 lbs.

Bulls

Under one year old	1,000 lbs.
Over one year and under two	1,500 lbs.
Over two years old	2,000 lbs.
Two bulls over two years	3,500 lbs.
Three bulls over two years	5,000 lbs.

Females—

One animal	2,000 lbs.
Two animals	3,500 lbs.
Three animals	5,000 lbs.
Each additional animal	1,000 lbs.

Hogs, goats, sheep and lambs, not crated, are not taken, except by special authority.

Hogs, sheep, lambs and other small animals, in boxes or crates, at actual weight.

When small animals are allowed to be taken without being crated, the following will be the minimum weights charged:—

A single sheep, lamb, pig or hog, 400 lbs., or actual weight, if in excess of 400 lbs.

Each additional sheep, lamb, pig or hog in the same car, to same consignee, 200 lbs., or actual weight if in excess of 200 lbs.

In order to entitle shipments of cattle, sheep and swine to these concessions, a properly attested certificate of registration must in all cases be produced, showing that the animal is pure bred, and admitted to full registry in a book of record established for that breed.

Unregistered young stock must be accompanied by breeder's statutory declaration descriptive of the animal and its pure breeding, and showing that it is eligible for registration, and that written application for certificate has been made to the secretary of the book of record for that breed.

Things Worth Knowing.

Shipments may be taken without man in charge, provided owners sign the usual contract releasing the company from liability in consequence thereof.

These special concessions for pure-bred stock will only apply when owners sign the usual valuation agreement for ordinary stock. If extra values are declared, the weights and rates will be as provided for valuable stock in Canadian Joint Freight Classification current at time of shipment.

No instructions have been issued by the railways in regard to reduced rates for pure-bred horses. Parties desiring to ship must make application to the General Freight Agent through the station agent a few days before the shipment is to be made.

Horses, Mules, etc.—

Colts, under six months	1,000 lbs.
One animal	2,000 lbs.
Two animals	3,500 lbs.
Three animals	5,000 lbs.
Each additional animal in the same car	1,200 lbs.
Mare and foal together	2,500 lbs.
Stallions and Jacks	4,000 lbs.

In cases of dispute with station agents, refer the agent to circular No. 1070 for C. P. R., No. 15 for C. N. R.

If this does not settle dispute, or other matters arise over which there is disagreement, pay the agent's charges, taking a receipt for the same; then write, explaining fully, to the General Freight Agent, W. G. MacInnes, Winnipeg, Man., for the C.P.R.; and to D. B. Hanna, Superintendent for the C. N. R.

Reduced Rates from Ontario.

The Eastern Live Stock Associations have obtained special reductions for car lots of pure bred stock from eastern points to all points in the west. They also undertake the collecting and shipping of single animals purchased by individuals. When a sufficient number has accumulated to fill a car, the animals are collected and shipped in one car in charge of a competent man. For full particulars of charges write to A. P. Westervelt, Secretary Live Stock Associations, Parliament Buildings, Toronto, Ont.

To Encourage Breeders.

In order to encourage breeders in the search of pure bred stock, the C. P. R. and C. N. R. Companies have offered to refund one-half the passenger fare on presentation of the standard receipt for the ticket purchased and the production of the shipping bill showing that such search had resulted in the purchase of one or more animals. This offer, made in 1900, is, of course, confined to Manitoba and the N. W. T.

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Express Rates on Pure-Bred Stock.

Calves, swine, sheep and poultry, when crated, are charged the regular merchandise rate.

When the weight exceeds 500 lbs. a special reduction of about 20 per cent. on the merchandise rate is made.

On August 22, 1900, a circular was issued from the Superintendent's office, Winnipeg, notifying all agents of the Dominion Express Co. that in future shipments of cattle, sheep and swine, in less than car load lots, would be accepted on lines west of Lake Superior at a reduction of 20 per cent. from the published tariff rates, between points where the distance exceeded 200 miles.

To entitle shippers to this reduction they must produce pedigrees same as for obtaining reduced freight rates.

Live Stock and Other Associations.

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	Secretary.
Horse Breeders' Association	G. Harcourt, Winnipeg
Pure Bred Cattle Breeders' Ass'n	G. H. Greig, Winnipeg
Sheep & Swine Breeders' Ass'n	G. Harcourt, Winnipeg
Poultry Association	F. Sheriff, Brandon
Horticultural Society	A. F. Angus, Winnipeg
Dairy Association	Miss E. Cora Hind, Winnipeg
Cheese & Butter Makers' Union	A. E. Hunter, Teulon

TERRITORIES.

Horse Breeders' Ass'n	C. W. Peterson, Regina, Assa.
Pure Bred Cattle Breeders' Ass'n	C. W. Peterson, Regina
Western Stock Growers' Ass'n	R. G. Matthews, Macleod, Alta.

In 1899 Canada imported 334 Shorthorns from Britain.

Stinting or half-starving young stock is sure death to all the profits.

England receives each day not less than 2,300 tons of dead meats from foreign countries.

The usual time required for food to pass through the intestinal tract of a horse is 48 hours.

Keep an eye on cow comfort—warmth will double the yield of a cow on the same feed as compared with cold.

VETERINARY.

Veterinary Questions.

The Veterinary Column of The Nor'-West Farmer is conducted by an experienced veterinarian and contains much valuable information. The following pointers are gathered from the answers to questions and from other sources :—

How to Give Medicines.—The simplest method of giving medicine is by mixing it in the animal's food. But this cannot always be done, as the animal may refuse to eat the mixture, or may be too weak to do so. It has then to be given in the form of a drench or a ball.

To Drench a Horse.—In drenching a horse a horn is always preferable to a bottle, for fear of breakage by the teeth. Standing at the right shoulder, raise the head with the left hand under the jaw, and with the right hand pass the lip of the horn into the side of the mouth and empty its contents, the head being kept up until they are swallowed. If the animal is violent, place a twitch upon the nose, to be held by an assistant; or, if he refuses to open the mouth, the tongue may be gently held to one side, the horn introduced, quickly emptied, and the tongue liberated at once. Under all circumstances, the greatest gentleness must be exercised. Nothing can be gained by impatience or by harsh treatment.

To Drench Cattle.—In giving liquid medicine a bottle is preferable to a horn because more manageable, and one is less tempted to use force to open the jaws and perhaps thus lacerate the tongue also. Elevate the head only enough to prevent the liquid running from the mouth. The bottle should not be pushed back far into the throat. The tongue should be left free. The following is a very neat and efficacious method : If standing, place the left side of the animal against a wall, and standing on the right side seize hold of the upper jaw by passing the left arm over the head and bending the latter far round to the right, slightly elevating it. With the right hand pour the contents of the bottle into the mouth at its angle, using the least possible force. Let the head go should the animal cough. Go on with the drenching as soon as the coughing stops. Otherwise there is danger of choking.

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A Good Condition Powder.—Gentian, sulphate of iron, one part each ; ginger, saltpetre and foenugrek, one half part each. A tablespoonful three times a day.

A Good Blister.—The following is a prescription for a blister :—Powdered cantharides, 2 drachms ; lard, 1½ ounces. Mix. Clip off the hair and rub in well for ten minutes.

Dandruff.—Dandruff is composed of the minute outer cells of the skin which flake off in little scales. There is nothing like elbow grease and a good brush for it.

Bots.—The presence of bots is only injurious to the horse when they are quite numerous and generally they may be present to a certain extent without doing any harm. The bot remains in a horse's stomach only from one summer till the next spring, when it passes away in the natural course of events. They may be removed by the administration of carbon bisulphide. It must be given in a capsule and on an empty stomach.

Bone Spavin.—The curing of a bone spavin is generally taken to mean the cure of the lameness. The removal of the enlargement is another thing and usually more difficult, but as the patient grows older the enlargement often grows smaller and may finally disappear. Bone spavins are often cured by firing, which is the time-honored and probably most certain way. Other means are blisters, tenotomy, patent remedies, etc.

Q.—Mare, 6 years old, is lame in left hind leg, and has been so for about six months. In making her stand over in stall she drags the foot, and is quite lame and stiff in the mornings. She rests nearly all on the other leg. Leg is not swollen.

A.—The symptoms point to spavin. Examine the hock carefully and compare it with the other one, and see if you can detect any enlargement at the lower part of the joint on the inside towards the front. A spavin will sometimes cause lameness months before any enlargement can be seen.

Bog Spavin.—**Q.**—What is the best way to cure a bog spavin in a colt 2 years old ?

A.—Clip off the hair over the swelling and rub in, for ten minutes, a blister composed of cantharides and lard 1 to 8. Tie the colt's head short for 24 hours, so that he cannot lick the blister off. At the end of that time wash off the blister and smear the part with lard. Repeat the blister every ten days until the bog spavin is cured.

Things Worth Knowing.

Treatment of Curb.—Q.—Will you please tell me how to cure a curb?

A.—Blister the curb and repeat as soon as the scabs can be washed off. Two or three good blisters will generally effect a cure, but if a severe case it may be fired by a veterinary surgeon.

Choking.—If in the throat, remove with hand; if below reach and the object can be located from outside, give small drenches of linseed oil and manipulate from the outside. Take time. Do not apply too much force. Do not try to crush the object between two blocks. Try to work the object towards the throat. If it cannot be removed, it must be pushed down. For this there is nothing equal to a prod, and every large stockman should have one. A good substitute is a piece of 1-inch rubber hose, 6 feet in length and well oiled. Insert in the gullet and gently push the object down.

Roaring.—"Roaring," as the sound made by a horse in this condition is called, is not a disease, but the symptom of an obstruction in the upper air passages. Nearly always this obstruction is one of the vocal cords of the larynx, which has become paralyzed, and instead of drawing to one side, hangs loose across the opening and vibrates in the passing air. The real cause of the trouble is disease of the nerve which supplies these delicate muscles of the larynx. Medical treatment is rarely of any use, but the condition can be relieved by a surgical operation.

Springhalt.—The cause of springhalt is still in dispute, some claiming it is a nervous affection resembling St. Vitus dance, others think it arises from a defect in the muscles of the thigh. It cannot be produced by overfeeding. It is not looked upon as hereditary and should not disqualify a stallion otherwise sound.

Chaff in the Eye.—Q.—What will remove the film from a mare's eye caused by chaff? Neither alum nor poulticing has any effect.

A.—If the chaff is still clinging to the surface of the eye no treatment will be of any use until it is removed. Sometimes the chaff becomes imbedded under a coating of lymph so that it is hard to detect, and the efforts of the horse to avoid inspection of the painful part increases the difficulty. If there is any reason to suppose that chaff may still be there, drop a little cocaine solution, 10 per cent., into the eye. In a few minutes the eye will be insensitive to touch, and you can examine it, and, if necessary, scrape off the chaff with the edge of a spoon. When sure that no foreign body is present the film can be removed by the daily application of calomel, a little to be blown on to the surface of the eye once a day.

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Wind Galls—Bursal Enlargements.—Q.—I have a horse, 5 years old, with a wind gall on his hind leg. It is on the outside at the gambrel joint. Will blistering take it off? It has been on about three months.

A.—A windgall "on the outside at the gambrel joint" is usually called a "thoroughpin," but the name is immaterial, for the nature of the swelling is precisely similar to the windgalls at the usual situation at the fetlock. These enlargements are caused by a dropsical condition of a sac, which contains synovia, or "joint oil," to lubricate a tendon or a joint. They are very difficult to remove, and have a strong tendency to recur. Frequently repeated blisters will in many cases remove them when applied soon after their first appearance, but old chronic cases generally require treatment by means of pressure applied by means of a specially constructed truss.

Q.—Colt about three months old has a windgall on the pastern joint, a bog spavin and a thoroughpin, all on the same leg. They all grew after birth. Blistered lightly with caustic balsam about six weeks ago, but it did no good. What treatment would you advise to remove these troubles?

A.—Enlargements of bursae frequently make their appearance about the joints of young foals and sometimes are congenital, that is, present at birth. In these cases they should not be looked upon as indications of diseased joints, as they would be in older animals. In the very young they arise from unusual laxity or looseness of the tissues surrounding the bursa, allowing it to bulge out in the parts where it is not covered by ligaments. In many cases they will disappear as the colt grows older, but it is wiser not to trust to a spontaneous cure taking place, but to assist nature by judicious treatment. Blister the swellings repeatedly every two weeks with cantharides, or fly blister. This will have the effect of thickening the ligament over the swelling, causing pressure on the bursa and its gradual disappearance.

Thoroughpin.—Q.—What is the best way to treat a thoroughpin?

A.—If recent, apply a fly blister, and repeat every two weeks for three or four times. If of long standing, a thoroughpin truss would be required, and as they are expensive, I would not advise its use on a cheap horse.

Swollen Leg — Stocking — Lymphangitis — Ulcerated Leg.—Q.—A colt, nearly three years old, has left hind leg swelled from the knee down. It swelled up last winter when the colt was put in the stable, after running on the grass all summer. The colt was put in the stable, let out to water and put back at once. When the leg swelled up first it broke out in two places. We bandaged it and washed it with carbolic water, until it healed. He was fed a dessert spoonful of resin in his feed every night. He was fed bran last winter; this winter we are feeding him half a gallon

of chop three times a day and resin at nights. We are also working him, taking the manure away from the stables and going back and forth to town, but the swelling still remains. He is a hearty eater and drinker. Is it grease?

A.—This is not a "grease" leg at present, but a chronic swelled leg, and very apt to develop into "grease" at any time from want of exercise or from over-feeding. Give him twice a day a powder containing powdered veratrum album., 30 grains; iodide of potassium, 60 grains; and soda bi-carb., 120 grains. Exercise every day and don't feed many oats. The removal of the swelling will be assisted by frequent bathing with hot water followed by brisk rubbing with a wisp of hay.

Q.—Will you please advise me what to do with a mare that has got a big leg, swollen to the hock? She has had this for about a year, and it will at times go down when she is working steady. Lately she was so lame upon that leg that I had to water her in the stable. The lameness has now gone, but the leg is as big as ever.

A.—A chronic swelled leg of a year's standing such as this is not an easy thing to cure, and will require some time and careful attention. The animal should be exercised or worked every day. After she returns to the stable take a pail of hot water and bathe the leg for half an hour. Wipe dry and then rub in some of the following liniment: Iodide of potassium, 1 ounce; oil of origanum, 1 ounce; methylated spirits, 1 quart. If the leg is hairy, it should be clipped. After bathing and rubbing the leg, apply a flannel bandage from the foot to the hock and leave it on until you take her out of the stable again. Banage moderately tight, avoiding creases.

Q.—I have a mare in foal which had scratches last spring, worse on off leg, some of which bled badly. I let her run a month on grass, and she seemed all right, but as soon as cold weather set in the leg began to stock again. I treated with concentrated lye, with little or no effect. Is stiff and sore on leg after working, otherwise mare in good condition.

A.—Give twice daily in the feed one drachm of iodide of potassium dissolved in a little water. If the mare weighs over 1,100, give a drachm and a half instead of one drachm. Use hot water bathing to the leg as often as possible, afterwards rubbing dry. The mare's pregnancy will make it a difficult matter to get the swelling down, but give her daily exercise, and persevere with the treatment.

Q.—I have a mare, three years old, that stocks up in left hind leg and at times trails the right leg; but only if she has been working on soft ground. There is a slight hitch or click when she gets control of the right leg—no apparent lameness. The mare was sold for four years old and turned out to be only two, so she was worked as a four-year-old and fed a little over a gallon of oats at a meal.

A.—Your mare has been injured by work and feed unsuitable for an immature horse. A condition of chronic lymphangitis has been produced in the leg and may remain permanent. Do not feed her much grain, especially if she is not working. Exercise her or let her run out at least part

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of every day. Give her twice a day one drachm of iodide of potassuim, dissolved in a little water, and added to her food or drink. In addition to this general treatment it will help greatly to give local treatment to the hind legs, hand rubbing them frequently, and if swelling is persistent, hot water bathing followed by rubbing in some liniment of camphor, especially over the large lymphatic vessels on the inside of the thigh.

Q.—I have a stallion, 12 years old, broke out on the left hind leg at the ankle. I fed him half a gallon of oats each day and poulticed his leg with bran. It has never healed yet and sometimes breaks out half way up to the hock and seems to sweat all the time and continued during his travelling season, but not so bad. It has broken out on the other hind leg the same way since coming off his season. I fed him grass, cold bran mash twice a day and he does not seem to be improving. A little swollen, but never lame.

A.—You had better discontinue the poultices. Apply the following powder, twice a day, on absorbent cotton, to the sores: Iodoform, $\frac{1}{2}$ part; burnt alum, 1 part; boracic acid, 1 part; hold in position by bandages loosely applied. Give internally powdered sulphate of iron, 1 drachm, morning and evening, in his feed, feed him well on good oats and hay, with an occasional bran mash scalded and allowed to cool before feeding it. You may give him gentle exercise daily.

Scratches.—Q.—Horse has had scratches for some time, and I have tried zinc ointment and other external applications, but without cure. His legs do not swell, and there are no signs of grease leg. Should not some medicine be given for the blood, and what would you recommend?

A.—Yes, an internal remedy will assist in effecting a cure. Would recommend powdered hyposulphite of soda—a tablespoonful in the feed two or three times a day.

Q.—Three-year-old mare, with scratches, legs very much swollen to hocks.

A.—Wash with castile soap and soft water and dry with soft towel, then apply following salve: Zinc ointment, one ounce; vaseline, one ounce; oil of cade, half an ounce. When the scratches are once clean and free from scab, do not wash again until they require it. Apply the salve twice a day.

Careful attention to cleanliness, and frequent applications of the benzoin lotion will generally effect a cure. The benzoin lotion is made of equal parts of the compound tincture of benzoin and oil of tar. This lotion is equally good for mange.

Cracked Heels.—Q.—Mare, 4 years old last spring, got cracked heels which never healed perfectly. If I do not keep them greased, they will keep cracking yet. Her hind legs swell badly when standing twenty-four hours. She is in good condition and feels good.

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A.—Reduce the amount of grain fed to about half the working ration. Exercise every day and give three times a day in the feed a tablespoonful of powdered hypo-sulphite of soda. Apply zinc ointment to the cracks.

Chronic Grease.—Q.—Horse had grease very badly, but stopped after a while; legs are still swollen and very cracky and do not heal nicely; blistered twice this summer, but do not get sound.

A.—Give a half teaspoonful of grey powder in the feed twice a day, exercise or work the horse every day, and apply following lotion to parts affected:—Red iodide of mercury, one drachm; iodide of potassium, two drachms; water, one pint. Wet the scaly cracks twice a day with this.

Capped Hock.—Q.—I bought a blooded colt, 4 years old, which has a puff on the left hind leg caused by kicking against a pole, which was put in to prevent him from kicking his mate. What will take it away without leaving a scar?

A.—The puff you speak of is a capped hock, a disagreeable blemish, as it labels the horse a kicker, and it is very difficult to remove. You must first arrange his stall so that there is nothing for him to bruise his hock against, if he should kick. Then apply the following:—Biniodide of mercury, two drachms; iodide of potassium, a sufficient quantity to dissolve the mercury in 10 ounces of soft water. Wet the swelling with this twice a day. When the skin becomes irritated stop the application until it recovers its usual condition.

Capped Elbow.—Q.—I have a mare 5 years old, has a lump on leg, and by picture of an unsound horse, I would call it a capped elbow. It is a soft lump and runs matter at times like a running sore.

A.—The swelling should be lanced at the lowest point. Keep the edge of the knife turned away from the bone and don't be afraid to make a deep incision. After the pus has run out wash the cavity with a solution of carbolic acid in water, 1 part to 20, using a syringe. Do this twice a day until it heals. See that she cannot bruise the part with heel of shoe, or by lying on bare floor.

Barbed Wire Cuts and Wounds.—Q.—A bad barb wire cut across shoulder of mare, done more than a year ago; was healed up, but part of it swelled, and the part gets puffy with use and rubs sore. I have fixed collar sweat-pad to avoid pressure. Can you tell me how to take down the swelling or disperse it?

A.—Make a lotion by dissolving one ounce of sulphate of zinc and one ounce of acetate of lead in a quart of rain water and bathe the swelling frequently with it. This lotion should also be applied as a preventative as soon as the collar is removed after work. Apply a little zinc ointment to the raw place.

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Q.—I have a mare 8 years old, got cut with barb wire on hind leg just below hock joint. About a month ago a small piece of bone about the size of a quarter came out. The wound is healing up now, but the leg still remains swollen. Can I give her something to remove the swelling, or will it go down when the wound heals up? When she gets exercise the swelling goes down to a certain extent.

A.—The swelling will gradually grow smaller as the wound heals, and then what little remains may be removed by rubbing in a little iodine ointment once a day.

Q.—Three weeks ago a three-year-old mare of mine went lame. I found a cut across the heel of her right fore foot about an inch and a half long, running under towards the frog. It has been kept clean, but it does not heal.

A.—The wound "running under" the hoof must be relieved from pressure of the hoof upon it. Pare away all the hoof and frog that lies next to the wound. If this is separated from the flesh it can easily be removed. If not, it requires care not to wound the flesh while cutting away the hoof or frog until only the thinnest possible layer remains. Now bathe the wound twice a day with the following lotion, and let it dry on:—Sulphate of zinc, one ounce; acetate of lead, one ounce; soft water, one quart. Keep the mare in a warm stable and don't cover the wound.

Q.—I have a mare which got cut with barbed wire on the under part of her front foot, about two months ago. The cut healed up in about three weeks, but ever since she can scarcely use the foot. She hobbles around, touching the toe on the ground. After the cut healed I bathed the foot and leg with hot water for several days, but it was of no use. Then I put on a blister, but that did no good. I turned her out in the pasture. Will the foot ever come right? I think that possibly the cords were cut or injured.

A.—Your mare has a good chance of getting better in time. Keep the hoof levelled, not allowing the heels to get too long. Rub in a little mild blue ointment on each side of the scar once a day and let her run in loose box when you take her in from pasture.

Q.—I have a horse five years old, 1,500 pounds. Three months ago he cut himself on the inside of the hind leg close to the joint, just through the skin. A fortnight later it started to get lame and swollen. I used cold water and worked at the same time for two weeks, it getting worse. I had to let him rest for about one month and put blister on, but the swelling did not go down altogether, but the lameness disappeared. I started to work and the horse turned worse than before.

A.—The skin wound became inflamed and the inflammation extended into the neighboring joint, producing arthritis. You will have to give up any idea of working the horse for some time, perhaps two months. If the joint is not painful to the touch, you should repeat the blister. If painful, do not blister until the acute stage is passed, but foment with hot water instead and after each bathing rub in a little anodyne liniment; menthol, one drachm; camphor, two drachms; oil of origanum, half an ounce; methy-

Things Worth Knowing.

lated spirits, one pint. The same liniment will be useful in removing the swelling after the lameness has disappeared.

Prick With a Fork.—Q.—I have a horse that got a prick from a fork just above the fetlock joint nearly a month ago. I have used nearly everything I can think of to cure it. It has not run much. I have bathed it in hot water, poulticed it and got linseed from a veterinary surgeon, but it is puffed up yet, and he is a little lame. He is in good spirits and eats well. I think it should be opened, then the swelling might go down.

A.—A punctured wound near a joint is a dangerous injury, and when made by a dirty instrument such as a stable fork is almost sure to give trouble. You do not describe the locality of the wound with sufficient distinctness to tell one whether the bone or tendons are injured, but probably the joint itself has escaped. You should certainly not open the swelling yourself, as you might injure the joint, cut a blood vessel or do some irreparable damage to the leg. If the knife is to be used at all, get a properly qualified man to handle it. A good smart blister will often work a cure in such a case as yours, and before trying more heroic remedies you would do well to apply one. Clip off the hair all around the joint and rub in the following blister: Powdered cantharides, 2 drachms; lard, 1½ ounces. This should be well rubbed in for ten minutes, allowed to remain there for 24 hours, during which the horse should be tied to prevent his biting it, and then the part should be washed and smeared with lard or vaseline.

Itchiness.—An itchy skin may be caused by external influences, such as parasites of various kinds, notably lice, and the acarus producing mange, and in a lesser degree by ordinary dirt and dandruff, resulting from want of proper grooming; or else it may proceed from internal causes, of which errors in diet, resulting in an overloaded condition of the system with impure blood, are the commonest. The mere presence of this symptom in horses is not enough to enable one to identify the cause, which must be carefully looked for on the skin, or in the condition of stable management. Should you fail to locate the cause, try the effect of a change of diet, giving less grain, more bran, and if possible, some roots, especially carrots, and groom the horse every day.

Q.—My horses are troubled with itchiness, more especially between the hind legs and under the belly. There is quite a scurf, which comes off when you rub it.

A.—Itchiness in the localities mentioned, on the legs and under the belly, is often caused by a minute parasite, much smaller than a louse, and belonging to the same family as the mites which cause mange in horses and scab in sheep. This parasite prefers to live on the skin of the hind legs, but is occasionally found on the lower part of the body. It may remain on the same horse for years, giving no trouble in the summer time, but causing itchiness in the winter

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months. The reason for this is that the parasite lives on the secretion from the tiny sebaceous glands of the skin. These pour out an abundant secretion in warm weather, but in winter their product is scanty and the parasite is obliged to bite the skin to obtain a living. Treatment of such cases is rendered easier if the legs are clipped. Wash the parts affected with soft soap and water to remove all scabs; then wet the skin thoroughly with a 4% solution of creolin in water. Repeat twice a week until cured.

Leg Mange.—Q.—Our horses have all broken out between the hind legs. They are itchy all over the body. When out loose they are biting each other's withers all the time or scrubbing their hind legs against the fence.

A.—Your horses are affected with something more than leg mange, and are either suffering from a general mange or have become badly infested with lice. The latter are not hard to find, and if you can't detect any, the trouble is probably mange. For the cure of this you should clip the horses and then rub them all over with the following liniment:—Creosote, 2 ounces; sulphur, 4 ounces; raw linseed oil, 1 quart. Where the skin is scabby or thick rub in well. In three days repeat the treatment, first washing scabby places with soft soap and warm water.

Lice.—A Nor'-West Farmer reader says:—"I have tried and proved to my own satisfaction that to thoroughly sweat a horse will cause the lice on him to come out to the end of the hair. Then I take a cloth saturated with coal oil and rub over the hair where the lice have come out. The oil will destroy them, as the sweat only drives them out. Colts I treat by putting on a blanket, fastening it down tightly and driving the colt around a circle by attaching to the halter shank about 30 feet of rope. Drive at a rapid gait, until thoroughly sweated; then rub over with oiled cloth. Allow the heated animal to cool down, but on no account water an animal until it is thoroughly cooled off."

Q.—Last fall, when still in good flesh, my calves became covered with lice. Used sheep dip and one or two other remedies, but without success. What is the best means of eradicating these pests?

A.—Apply fish oil to the calves, and kerosene to the wood-work where they are in the habit of rubbing themselves. The disappointment often caused in the use of remedies for lice, lies in the fact that many remedies which destroy the mature parasites have no effect on their eggs or "nits," and when these hatch out, the animal is soon as bad as ever. For this reason the remedy selected may have to be applied more than once.

Thos. Daly's Remedy.—Take one pint of coal oil and mix with two quarts of buttermilk. Rub in with a brush until the skin is wet.

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Fish oil is generally recognized as being the best thing to kill lice on cattle. Run the clippers along the spine, then apply a liberal coating of oil. This will run down the sides and as it dries up will kill all lice and "nits." Where they are in the woodwork of a stable apply kerosene.

To Kill Ticks and Lice on Sheep.—Dipping is the best method of eradicating these pests. The best time to dip is about four to six weeks after shearing; but, if the sheep are badly affected, dip at almost any time, using judgment, of course. A bath where the sheep can be covered all but the head is much better than pouring, sprinkling or dusting. Kerosene emulsion is an effectual dip. It can be made by dissolving one quart of soft soap in two quarts of boiling water; while the water is still hot, add one pint of kerosene oil, and violently agitate the whole until an emulsion is formed. Then dilute by adding four quarts of water. But any of the well-known sheep dips on the market are effectual.

Warts.—Q.—2-year-old colt has two warts on front foot; one is as large as an orange, the other has just started. I had one cut off last fall, and it is now much larger.
A.—If the wart has a sufficient neck to hold a ligature, that is the best way to remove it. Procure a couple of feet of thin rubber tube at the druggists, wind it tightly round the neck of the wart two or three times and tie it. The wart will drop off in about a week or ten days. If there is no neck to it, it may be sliced off with a sharp knife and the place cauterized with a red hot iron. This is painful and should therefore be done under cocaine anaesthesia by a surgeon. Small warts may be removed by rubbing them with a crystal of chromic acid.

Q.—I have a yearling heifer which has had warts on her cheek for over four months. They are from the size of a bean to half the size of an egg. They are extending down to about the chest and are a little smaller than those on the jaw.

A.—Procure from a druggist some of the solution of chloride of antimony (liquor antimonii chloridi) and apply it to each wart with a feather or small brush. Avoid touching the surrounding skin with it. This liquid caustic will destroy every part of the wart it comes in contact with and for small warts only one application will be required. The larger ones will need to be touched again after the tough scab which forms after the first application has dropped off.

Warty Growth in Eye.—Q.—Five months ago my cow had a little scratch at the bottom of her eye. I tried all kinds of things to cure it—iodine, bluestone, etc. Now it hangs out about one and a half inches. It looks like rotten beef. The cow often bruises it with her foot and rubs it against the manger. It is about three inches in diameter. She is healthy and in calf.

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A.—This is probably a cancerous growth known as Fun-
gous Haematodes, rather frequent in eyes of cattle. It is in-
curable by any but surgical methods, and the sooner after
calving you have her operated upon the better.

Q.—An eight-year-old horse has a wart on the side of his
jaw; whenever he gets warm the top comes off and it bleeds.
What can I do for it?

A.—Rub a stick of caustic potash all over the surface of
the wart, taking care not to touch the surrounding skin. In
three or four days pick off the scab and repeat the applica-
tion as often as necessary.

Q.—Kindly advise treatment for warts around the eye on
a yearling heifer. I have applied castor oil several times,
but with no apparent effect.

A.—Apply formalin once a day to the surface of the wart,
being careful not to let it get into the eye.

Q.—Give treatment for warts on horse's nose.

A.—Apply solution of antimony to each of the warts with
a feather, avoiding the healthy skin.

Ringworm.—**Q.**—Give cure for ringworm.

A.—Paint the ringworm with formalin once a day until
cured.

A.—Pick off any dry scabs and paint the ringworm with
pure formalin. Two or three applications will cure.

A.—Mercurial ointment, 1 part; milk of sulphur, 1 part;
oil of tar, 1 part; lard, 6 parts. Get your chemist to make
up what you think will be enough to dress them thoroughly
twice, and do it. A week later rub in one part of paraffin
and three parts of colza oil.

Worms.—**Q.**—I have a mare which passes worms from
six to ten inches long. She is very dry in the hair and is a
ravenous eater. She always sweats very easily in the sum-
mer and her bowels are always loose.

A.—The presence of worms in the bowels would account
for the condition of your mare and the tendency to loose-
ness. It is not always easy to rid a horse of worms, but the
following treatment is usually successful: Prepare the mare
for physic by feeding her bran mash without hay for
twelve hours; then give her a dose of aloes, from seven to
nine drachms, according to size. This may be given in a ball
or in a drench, as may be most convenient. Continue feed-
ing bran without hay until the physic operates, which will
be in about twenty hours. As soon as the passages are loose
give the vermifuge dose, consisting of one ounce to one and
a half ounces of turpentine in a pint of milk. Two hours
after this is given the mare may be fed hay and her usual
diet as before. This treatment should be repeated in about
two weeks to remove the fresh brood which may hatch out
from ova left in the intestines by the mature worms expelled.
A colt should have about one quarter the dose given to an
adult.

Things Worth Knowing.

For pin worms in colts give half ounce divided into four doses ; to a good-sized colt, give in a bran mash night and morning and allow but little other food. After the last dose give some opening medicine, such as half a pint of linseed oil. If many worms are present, repeat in two weeks.

A.—Prepare the horse for physic by a night without hay, then give a physic ball. The animal should get no feed after this except bran mashes for 24 or 30 hours. Water should be allowed freely. As soon as the purgative begins to operate, give the following drench : Santonin, six drachms ; oil of turpentine, two ounces ; milk, one pint. Two hours after this has been given you can put him back on his usual feed. It would be advisable to follow the above treatment by giving one drachm of powdered sulphate of iron in the feed three times a day for a week.

Q.—Year-old colt has worms resembling red silk, about half an inch long. What is the quickest and surest cure for them ?

A.—The worms infesting your colt are not of the ordinary variety of pin worms, but a species which fortunately is not so common, as it is much more injurious to its host. This species is found attached to the mucous membrane of the large intestine, and feeds not upon the contents of the bowel, but by sucking blood from its walls. Hence its red color, and its destructive nature. In consequence of its feeding habits there is great difficulty in getting rid of them, for as they do not feed on the intestinal contents, the usual vermifuges are not of much use. We recommend you to use spirits of turpentine, giving a few drops in the feed twice a day and increasing the dose gradually up to a teaspoonful. After the colt has taken it for a week, give him a purge with six ounces of linseed oil, and when he has stopped purging repeat the previous treatment.

Saddle Gall.—Q.—Please let me know what is the best remedy for an old saddle sore on a horse. This sore (on back-bone) heals over after a couple of weeks' rest and care, but if the horse is warmed up again the skin breaks and a few drops of a mattery nature is discharged.

A.—When the sore is healed by rest and the application of healing remedies the cicatrix or scar remains tender for some time and is easily injured by pressure of saddle or harness. It is necessary to employ something to toughen the cicatrix and make it more resistant to pressure. This may be accomplished by rubbing in daily a little astringent ointment such as the following :—Powdered galls, three drachms ; powdered opium, one drachm ; lard, one and a half ounces. Make an ointment. The saddle should not press anywhere along the spinal column. If it does so it is either badly made or unsuited to your horse and should not be used on him.

Sore Back.—Q.—I have a mare that has a sore on the backbone above the hips, caused by a knot being tied in the crupper of the driving harness. The sore continues unhealed and is very hard to cure.

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A.—Bathe the sore twice a day with the following lotion :
Sulphate of zinc, half an ounce ; acetate of lead, half an
ounce ; soft water, one pint. As soon as it has dried up
and shows a tendency to scab over, use a little zinc ointment
on it every day.

Sweeny.—Q.—I have a mare, four years old which was
sweenied. The depression in the shoulder has not filled up.
Can she be worked, and also can anything be done to cause
the cavity in her shoulder to fill up ?

A.—Sweeny is the popular name for atrophy or wasting of
the muscles of the shoulder. This may arise from either of
two causes : 1st, a strain of the muscles of the shoulder ;
2nd, any long continued lameness in any part of the leg.
In your mare the first is doubtless the cause, for the lame-
ness has ceased and only the effects in the shape of wasted
muscles remain. To restore the muscles to their natural
condition they must be stimulated either by frequent rub-
bing with some good embrocation, or by light and frequently
repeated blisters, and in addition to this local treatment the
mare should be exercised. Light work, which requires no
heavy pulling, will do her good, but heavy work must be
avoided, especially plowing. In any case the restoration of
the wasted muscles will take some time.

Lame Shoulder.—Q.—Saddle horse is lame in shoulder.
Caused by one day's hard riding and carrying considerable
pack, which was divided in front and back of saddle. Turned
him out for two months, so that he became well except a
slight stiffness in the limb. The first time he was worked
again was to cut out a wild steer from the herd and while
running he fell and became very lame again, the same leg
swelling from the knee upwards, but the soreness was con-
fined to the shoulder. Since then there has been a gradual
swelling coming on point of shoulder, which is now the size
of a hen's egg flattened, but is not sore to him. He is, how-
ever, quite lame in the shoulder.

A.—Your saddle horse seems to have strained the tendons
of his biceps where it passes over the point of the shoulder.
Rest and repeated blisterings will be the best means of
treatment. Clip off the hair from a space six inches in dia-
meter over the point of the shoulder and rub in for ten
minutes the following blister :—Powdered cantharides, two
drachms ; lard, ten drachms. Tie the head short, so that he
can't get his mouth to the part, and after twenty-four hours
wash it off and smear the part with lard. Repeat the blister
as soon as the skin recovers from the effects of the first
one, usually in eight or ten days.

Keeping Shoulders Sound.—Sore Shoulders.—Q.—Is it
possible to keep horses' shoulders from getting sore, and
how ? What is the best and quickest way to cure them
when they get sore ?

Things Worth Knowing.

A.—Keep horses shoulders well by carefully fitting the collar, and hardening the skin gradually to the pressure of the collar. After a winter's comparative idleness, the shoulders are naturally tender and will not stand the pressure of severe work unless hardened to it. This may be accomplished by giving a little collar work for this purpose a few days before regular hard work begins. Also by bathing the shoulders with an astringent lotion, such as two drachms of tannic acid dissolved in a pint of water. This is applied to the shoulder twice a day when the collar is taken off and toughens the skin considerably.

Q.—My horse at the commencement of hard work has a puff or swelling just above the point of the shoulder, no matter how I arrange the draft. The puff, as it increases in size, throws out a fluid matter, which sticks to the sweat pad, which in turn irritates the swelling. In winter can be felt under the skin, just like a rough spot.

A.—Apply the following lotion frequently :—Sulphate of zinc, one ounce ; acetate of lead, one ounce ; soft water, forty ounces (1 quart). Wet the part with this immediately after work.

Q.—Horse had sore shoulder, but is healed, leaving a small lump. Can it be taken out by blistering, or will it be necessary to have it cut out by a veterinary surgeon ?

A.—This is a case for surgical interference. Such callous enlargements of the shoulder can only be removed by the knife.

Q.—Large soft swelling came on point of mare's shoulder some time ago. I opened it at bottom and a quantity of thin watery blood came out. I kept it open over a week and syringed with weak carbolic and then let it heal, keeping it greased. It has left a hard lump (as hard as bone). Edge of sweat pad just covers it and does not appear to interfere with her drawing a load.

A.—External remedies are generally useless in such a case and the growth must be removed with the knife. Unless the swelling is where the pressure of the collar will not reach it you are sure to have trouble from it when hard work begins.

Dislocation of Patella.—Stifle Lameness.—In front of the stifle joint there is a small bone called the patella, which corresponds to the knee-cap of man. It moves freely up and down in front of the stifle joint when the leg is flexed and extended, but its movements from side to side are limited by the ligaments which bind it to the other bones. In spite of the strength of these ligaments the patella may become dislocated in either of two directions. The inner ligament may become ruptured or stretched and allow the patella to become dislocated outwards, or else the contraction of the muscle which draws the patella upwards may be excessive, and the bone is carried above its usual position and becomes fixed upon the upper edge of the condyles of the femur. In both these positions of the patella the leg becomes stiff and the animal is unable to bend it until the bone returns to its place. Frequently a sudden movement of the horse is suffi-

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cient to restore the patella to its normal position, but some-
times the aid of the surgeon is required. When dislocation
has once occurred it is very apt to occur again until the
stretched or ruptured ligaments have resumed their function
and are able to maintain the bone in its proper position.
After the patella has been replaced, a smart blister should be
applied over the site. This has a two-fold effect. The
swelling produced will assist in keeping the patella in place,
and the pain of the blister will cause the animal to move
the leg as little as possible. To prevent recurrence, keep the
heel low and the toe long, and if shoes are applied, let them
project a little at the toe.

The condition may become chronic if the dislocation
occurs frequently, and should be combatted by the applica-
tion of a stifle shoe to the foot of that leg. This is an ordi-
nary shoe which has welded into the toe a piece of iron that
projects some two inches and is slightly turned up or round-
ed in front. With this shoe on the foot it will be more dif-
ficult for the patella to be displaced, and the ligaments will
gradually shorten and keep the bone in its proper position,
and then the shoe can be dispensed with. An occasional
blister over the joint will help in effecting a cure.

To Heal an Old Sore.—Wash the sore with soap and water
until clean, then with a sharp-edged spoon scrape the surface
of it until the outer layer is removed and it bleeds freely.
Now wash it with an antiseptic lotion made by dissolving
two antiseptic tablets of corrosive sublimate in a pint of
boiled water. This solution should be of the strength of 1
to 500. Use a clean linen rag to wash it with and continue
to bathe it with the lotion until the bleeding stops. Then
dust the surface with a powder composed of iodoform one
part, boric acid, one part, white sugar, two parts. This will
form a dry scab, under which the sore should heal rapidly.
If the scab becomes loosened wash with the lotion again and
apply more of the powder. Keep the horse tied up so that
he can't lie down until the wound is healed. The swelling is
caused by the irritation of the unhealed wound and should
disappear when that is better.

To Heal an Open Sore.—Wash the sore with creolin and
water, 1 part to 40, then dust the raw surface with a powder
composed of boric acid, finely powdered, 2 parts; iodoform
crystals, 1 part. This may be put into an insect powder gun
and blown on to the moist surface, where it will adhere and
form a healing and protecting covering. This should be
done once or twice daily.

Contracted Hoof.—For contracted hoof, remove the shoe,
pare the foot until the sole is level, but do not touch the
frog with the knife. The frog is nature's wedge to keep the
heels open, and it is the lifting of the frog above the surface
of the ground which is a consequence of shoeing that is one
of the causes of this condition. Absence of frog pressure

favors contracted heels. Frog pressure tends to cure them. Let your horse go barefoot, if possible; if shoes are required, let them be as thin and flat as possible, to allow the frog to touch the ground. Let the horse stand on an earthen floor if possible; if not, pack them frequently with clay or linseed meal poultice. To stimulate the growth of a larger hoof the coronet should be blistered at intervals of two weeks with a fly blister. If this treatment is carried out the feet will gradually improve in size and shape.

Strained Tendon.—Q.—I have a horse, seven years old, driver, walks lame in fore feet after being driven, stands with the off foot forward when in stable; also keeps lifting it every now and again. Think it might be a strained tendon.

A.—If the tendons are swollen and tender, bathe them in water as hot as can be borne, then dry them, rub in a little tincture of arnica and bandage the leg with a dry woollen bandage. If the tendons are not sore to the touch, blister them by rubbing in for ten minutes an ointment composed of 2 drachms powdered cantharides and one and a half ounces of lard. Rub in vigorously after clipping off the hair. Do not use the horse until fully recovered or the strain may become worse again.

Laminitis—Sore Feet.—Q.—Have a mare, 4 years old, that got an over-feed of ground wheat; next day was very stiff, but in three days was perfectly over it as far as I could see, until three weeks ago, when I noticed her a little stiff, and she has gotten worse. For about five minutes after she gets up she seems to be in great pain in front, which she shows by crossing her fore legs, first one, then the other. If driven a mile or so, can scarcely notice it on her.

A.—Soreness in the feet is a common sequel to an over-feed of wheat, and often remains a permanent condition. Your mare is young and has a good chance of getting over it. Let her stand on an earthen floor in place of planks, or if that is not attainable, keep her feet cool and moist by stuffing them with linseed meal made into a stiff mass with water. A good sharp fly blister applied to the coronets will have a good effect in removing the soreness.

Q.—I have a horse, 5 years old in the spring. A year ago last summer he took lung fever and has been stiff ever since in his front feet. He stumbles badly when he strikes his toe. He is quite fleshy now and very healthy. The cords in the back of his legs are generally swollen, and worse when working.

A.—This horse seems to be affected with chronic laminitis, or soreness in the feet, and suffers also from tenderness in the back tendons. You should avoid working him anywhere except on soft land. Do not use him on the road. Keep him shod with a large heavy shoe without caulks, so that the frog can reach the ground. If you can give him a run on the pasture after the spring work is over, it will do him a lot of good. In that case take his shoes off. The swollen tendons are best treated by hot fomentations, followed by rubbing in some liniment.

Lampas—Lampers.—Lampas is a disease much talked of among grooms and blacksmiths, but treated with scant courtesy in veterinary books, being generally passed over in silence or else referred to as an imaginary ailment, existing only in the minds of ignorant hostlers. The reason for this is that lampas is not a disease per se, but only a symptom of severe derangement in the mouth or stomach. To treat it as the "cause," when in reality it is only an "effect" of some other trouble is the illogical method pursued in too many cases by the local wiseacre who may have heard that your horse is not thriving. He opens the animal's mouth and points to the fullness of the gums behind the upper teeth, and says confidently, "He has the lampas," as if that was sufficient to account for anything. If you don't happen to think yourself proficient in horse knowledge, you most likely bow before his superior horsiness, and submit your horse to be lanced with a knife, pricked with a horse nail, or possibly (though don't tell anyone) to have the lampas burnt out with a red-hot iron. The horse suffers but can't say anything, and if he afterwards shows any improvement in condition, why, the lampas cure did it. It is hardly necessary to point out the absurdity as well as the cruelty of the business.

The tumified, swollen condition of the gums known as lampas is a natural condition in young horses, and is concurrent with the period of eruption of fresh teeth. Consequently, a mare, aged 4, and replacing several of the milk teeth with permanent ones, as well as making preparations for the eruption of the last molar in each jaw is just at the period when this condition would naturally occur. To treat lampas is a mistake and has been exposed so long and so often in the columns of agricultural and other papers that it is surprising to find that people still believe in it. There are people, too, who won't plant their potatoes or hoe their corn until the moon is in the proper phase, but perhaps it is better to leave them in their simple faith than to be taken by the cold logic of facts.

Influenza—Pink Eye.—Influenza is known by the symptoms of a feverish cold, high temperature quickened pulse, cough, nasal discharge (not always), quickened breathing, loss of appetite, great weakness. There is no specific cure for it, but each case requires to be treated according to the urgency of the symptoms. All, however, are benefited by rest, dieting, and good nursing, and without these no treatment is good.

Pink-eye is another name for influenza. Treatment varies according to the symptoms presented. There is no specific remedy for it.

Q.—My horses have pink eye, and I give a teaspoonful three times a day on their tongues, equal portions of nitrate of potash and chlorate of potash. Why do mares with it cast their colts? Is it the medicine, or what is the cause? What medicine would you advise to give?

A.—Pink eye is the popular name for influenza of a severe type. It is a very debilitating or weakening disease and frequently causes abortion in mares. The disease is seldom fatal, but horses affected with it should not be neglected on that account, for exposure to cold, or fatigue from working a sick animal, will cause dangerous if not fatal complications to arise. Do not give potash salts to horses affected with pink eye. Muriate of ammonia is much better, and is given in similar doses. Finely powdered camphor is a good remedy in cases when there is much prostration, given in doses of one half to one drachm. Keep the patients warmly clothed, and feed carefully.

Distemper.—In treating distemper, nursing is equally, if not more, important than medicine. The patient should be kept out of draughts, and, in winter, warmly clothed. The food should be chiefly bran mashes with occasionally boiled oats. When the swelling appears at the throat or under the lower jaw endeavor to bring it to a head quickly by applying hot poultices, frequently renewed. When the abscess discharges cease poulticing and foment with warm carbolic solution. In severe cases, when suffocation is impending from excessive swelling in the throat, the animal may be saved by a surgical operation known as tracheotomy.

Chronic Cough.—**Q.**—I have a 2-year-old filly which took distemper last spring and also took inflammation of the lungs at the same time. She has had a cough at times ever since; is in good condition now and doing well, excepting the cough.

A.—Chronic cough following inflammation of the lungs is not always easy to cure, but you will find the following a useful remedy:—Iodide of potassium, $1\frac{1}{2}$ ounces; fluid extract of hydrastis canadense, 1 ounce; glycerine, 1 ounce; water, 8 ounces. Give a tablespoonful twice a day.

Q.—I have a six-year-old Clyde horse, has had cough about three months, always coughs after drinking, or after having a sharp pull breathes heavily. Feed straw, oats and bran, occasionally boiled feed.

A.—Don't give any bulky feed, such as straw, unless at night. Give him twice a day in his feed the following powder: Powdered digitalis leaves, one scruple; powdered muriate of ammonia, one drachm.

Ophthalmia—Sore Eyes.—**Q.**—A lot of my cattle are suffering from disease of the eyes, that causes complete blindness. It starts as if the pupil of eye was bulged out and discharges from eye, and then the whole surface is covered with a white film.

A.—This is a contagious form of inflammation of the eye and the most important thing to do is to separate the healthy from the diseased and prevent the spread of the malady. The diseased ones should be confined in sheds or shaded

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yards until the acute stage is passed, and should remain separate from other cattle until the eyes are free from any discharge. With wild cattle it will be difficult to treat them farther than this, but if you can handle them, drop a little of the following lotion into the eyes twice a day after washing away all discharges: Sulphate of atropin, 5 grains, distilled water, two ounces. Use a medicine dropper or a camel's hair brush. A very little is needed at a time, two or three drops being sufficient.

Q.—Mare, six years old. First one eye became partly blind, half closed, ran water (especially in the mornings), and slightly feverish, the eyeball being much inflamed or blood hot. The eye became first dull, then murky or smoky, and finally looked exactly as if the pupil had been ruptured and run into the rest of the eye. In about a week the other eye went precisely through the same stages, and I was afraid she was going blind. Now both eyes are as bright and clear as ever.

A.—Your mare has had an attack of ophthalmia, beginning in one eye and extending to the other by sympathy. The cause of such attacks are often obscure. External violence may, on the one hand, produce it, while causes acting upon the constitution of the animal are also able to induce it. Of the former, blows upon the eye-ball, foreign substances beneath the lids, or puncturing wounds of the eyeball are the most frequent. The latter are such influences as tend to give the system a severe shock, such as plunging into water when heated, infection with influenza or rheumatism, etc. One attack is often followed by others. You should be on your guard for the first symptoms of its reappearance, and treat by dropping into the eye several times a day a solution of four grains of atropia to one ounce of distilled water. This dilates the pupil and prevents adhesion between the iris and lens. Keep the mare in a dark stable until the attack is over. Repeated attacks usually result in blindness.

Difficulty in Passing Water—A Bean.—Q.—Horse has trouble in passing his water. Sometimes he passes it frequently and only a little at a time, nearly always holding back his penis in the sheath and allowing the water to scatter all over and even run along his belly. Have washed out his sheath and given saltpetre, but seems no better.

A.—The trouble in his water probably arises from the presence of what horsemen call a bean in the end of his penis. You should withdraw this organ from the sheath and examine the end of it. The "bean" is a collection of waxy matter in a little cavity just above the opening in the end of the penis. It feels like a hard lump beneath the skin of the part, and when large it interferes with the passage of urine, and may cause serious trouble. The bean should be removed by squeezing it out or picking it out with the finger.

Rupture, or Hernia.—Q.—Went to castrate a litter of pigs three weeks old and found four of them ruptured. I operated on three of them and sewed up the opening and the

other I let go. Did I do right, or what should I have done? How will I operate on the other one?

A.—Your operation was all right and should have been successful if properly performed. The proper points are to make the incision as small as possible and at the upper part of the sac. Avoid dragging on the cord when removing the testicle. Cleanse the skin with carbolic solution before using the knife, and afterwards be careful to get the edges of the cut into close contact everywhere. Horse hair makes a good material to sew with, but should be carefully washed first, or what is better, boiled for a few minutes.

Q.—I have a horse colt, about three months old, with a rupture on the navel about the size of an egg.

A.—Small ruptures, like the one you describe, will generally disappear as the colt grows older, and you should therefore, refrain from doing anything for two or three months longer. If the rupture still remains, after the colt is six months old, it will be advisable to take him to a veterinary surgeon for operation. There is no danger from the operation, and a successful result can be confidently expected.

Symptoms of Tuberculosis.—The symptoms depend upon what part of the animal is attacked by the disease. As the lungs are the most frequently affected organs, the usual train of symptoms begins with a cough. The cough is an occasional dry one and may occur at more or less frequent intervals through the day. This may be the only symptom shown for some time, but gradually a change may be noticed in the cow's condition. She becomes unthrifty, her coat less sleek, her milk is less in quantity and then she begins to lose flesh. From this on to the end the progress down hill is more rapid, and the cow gets thinner and thinner until she dies.

When the liver or glands of the abdomen are affected the symptoms are usually of indigestion and diarrhoea, and this is the form frequently seen in young calves which have become infected through the milk.

It must be remembered, however, that very extensive disease may exist in a cow without any symptoms being detectable. Such cases are only revealed by the tuberculin test, and the post mortem examination of such cattle is often very surprising.

Symptomatic Anthrax, or Blackleg.—Blackleg, or, as it is scientifically known, "symptomatic anthrax," is a disease caused by a germ which gains access to the body through some insignificant wound or scratch, and rapidly multiplies in the tissues, producing a characteristic swelling. The crackling sensation felt on handling the enlargement is caused by the gas which is given off by the germs, and cannot escape from beneath the skin. Death is caused by the toxins or poisonous products of the germs, which get into the blood and produce an effect similar to snake venom. As the germ of this disease remains in the soil of infected pastures, it is important to know

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how it can be prevented. The Pasteur vaccine is the most certain preventative known, and when properly used will render the cattle inoculated proof against the disease during the grazing season in which it is used. As cattle over two years old are naturally immune, it is usual only to inoculate the young stock. Setons in the dewlap have only a slight protective value and should not be depended on.

Treatment of a Burn.—Q.—A horse of mine got badly burned in smudge. The hair and skin are all coming off. I have bathed it freely with hot water and have used linseed oil. Would like to know what to apply to get hair to grow again, and should I give medicine, and what? What would be the best feed for it?

A.—Apply carron oil freely to the burns twice a day, and if the wounds are suppurating, that is, forming matter, keep them clean by frequent washing with soap and water, afterwards applying the oil. Carron oil is prepared by taking equal parts of linseed oil and limewater and shaking them together until a creamy mixture is formed. It is a very soothing and healing application for burns. The feed of the mare should be light, and bran mash and grass would be better for her than oats and hay. Keep her in a darkened stable until the wounds scab over to avoid flies. To promote the growth of hair after the wound has healed, pour a little coal oil on a rag and rub it gently over the bare places two or three times a week. When the scar is pink or white the hair follicles have been damaged and no application will induce hair to grow.

Taming an Unruly Bull.—Q.—Could you tell me how to manage or tame a viciously inclined bull, just three years old—getting worse as he grows older? The more you beat him the worse he gets. I should like to know what drug could be used to quiet him or dull his senses. Also how to apply or dose. I saw something in *The Farmer* some time ago of how to subdue a bull by throwing him. Now, when he is down, what could one do to him? He will lead all right, if all is quiet; but if excited he is almost too much to hold even by his ring. Could his nose be made more tender? If so, how?

A.—Your idea of using drugs to control your bull is not a good one. Drugs produce only a temporary effect, and, although it would be easy to stupify him for a time by a full dose of narcotic drug, the effect would soon pass off and he would be in the same temper as before. Anything like systematic and long continued drugging would be sure to injure his health. Your best way of treating him is to train him until he realizes that you can easily master him, not by beating him, but by the more humane method of throwing him. It is not necessary to do anything to him when he is down, except to prevent his rising until you are ready. Do not think that one lesson will be sufficient; you may have to throw him frequently, but whatever you undertake to do, be sure that you carry it out. If the bull manages to escape being thrown through want of sufficient men on the rope,

or through the rope breaking, your work will be more than wasted, for the bull will have learned his strength and be harder to master than ever. A Canadian Ayrshire bull, that won a very high place at the World's Fair, was so wild and wicked that his owner would not take him to the show. A stranger to the bull, with four men on the rope, broke him so that he could do what he pleased with him. It took them some two or three days to do it.

Boiled Linseed Oil.—Boiled linseed oil should never be given to horses. Instances are on record of fatal results from the accidental administration of boiled oil in mistake for raw. The boiling seems to produce a change in the oil which renders it injurious to horses, and perhaps the materials which are added as driers may have a directly poisonous effect.

Clipping Horses.—Clipping in the spring is a most beneficial operation to horses that carry a heavy coat and are slow in shedding it. The only drawbacks are the liability of horses to taking cold during the first few days following the clipping, and the effect that clipping has in causing the coat subsequently to be rather harsh and staring. In fact, it is well known to horsemen that once a horse has been clipped a few times it is almost impossible to keep him looking decent unless he is clipped.

Milk for a Foal.—Q.—Would you kindly tell me how I am to rear a colt which the mother will not have near her? How much cow's milk should it get at one time and how often should it get sugar in it, and how much? Should it get any grain as soon as it will eat; what kind and how much?

A.—The milk of a mare differs from cow's milk chiefly in containing twice as much sugar and only about half as much casein, and it is richer in butter fat than the average cow's milk. To render cow's milk suitable for rearing a young foal, then, we should dilute it to lessen the proportion of casein, and add cream and sugar to increase the quantity of these ingredients. In actual practice it is found sufficient to add water and sugar to good ordinary cow's milk. To each pint of milk add half a cup of water and a teaspoonful of sugar. This should be warmed to blood-heat and when the colt is new-born given about every two or three hours for the first few days. Then increase the interval gradually, so that when the colt is a month old you need feed him only three or four times a day. As soon as possible get him to eat grain, beginning with a little oatmeal taken from the hand, coaxing him along until he will eat whole oats.

Hand-Raising Colts.—Q.—Can you advise as to the best method of raising a colt by hand? I have two mares in foal and I need them to work constantly on the farm.

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A.—Rearing colts by hand is at best a poor substitute for nature's method, and no matter what substitute for the mother's milk is used, the colt never does as well as he would have if reared in the natural way. If you decide to take the foal from its mother at once, it should be given something to take the place of the colostrum or first milk secreted, which is a natural laxative to the young animal, and causes a proper evacuation of the bowels. Half a cupful of sweet oil may be given for this purpose before attempting to get the foal to drink. During the first few days the foal should be fed every three hours, gradually lengthening the interval as the colt grows older and learns to eat other food. The milk must always be fresh, sweet and warm, and should be diluted with a little lime water, and sweetened with sugar. The difference between the milk of a mare and of a cow is that the former contains more fat and sugar and less casein. The addition of lime water and sugar to cow's milk makes it more nearly resemble mare's milk in composition, but it still is deficient in fat. This can be added in the shape of cream, or as a cheaper substitute, boiled flax seed tea, the seeds being strained off. Lime water can easily be made for yourself by placing a lump of quick lime as large as a brick in a pail of water, allow it to stand for a time and then pour off and use the clear portion. Add two tablespoonfuls of this to each pint of milk, and a large teaspoonful of sugar. As soon as possible get the colt to eat oats. Begin by offering him a little oatmeal from the hand, and as soon as he relishes this he will eat a few crushed oats night and morning.

Colic in Horses.—Care should always be taken to start horses on new grain slowly and thus avoid any danger of indigestion and colic. What applies to horses is equally applicable to cattle put up for feeding. Begin the meal ration with a small amount until the animals become accustomed to it. Don't try to crowd them from the first or they will soon have indigestion and make slow progress. The following article on the subject of colic, by C. D. Smead, V.S., in the National Stockman, is so good and to the point that we reproduce it for the benefit of our numerous readers : In the humorous columns of a paper I read the following : "A farmer was complaining to some by-standers that he did not know what was the matter with his horses. He had tried everything he could think of—condition powders and other specifics—but to no purpose. They would not improve in flesh. A stable boy who was standing by modestly asked, 'Did you ever try oats?' " Now I don't know where this occurred, neither do I know the boy, but many is the time I have heard farmers, and townspeople also, who owned horses make such complaints and then go and tell me how well they fed and cared for their horses. And I can imagine just how the boy felt, for I have been in his position exactly and perhaps said what he did, only he said it modestly—I hardly think I have always. The boy was probably right when he suggested oats as a trial remedy. I have done that lots of times, but I had to get them fed as best I could. To illustrate : A large number of horses in this country have impaired digestion, brought on in colthood by their owners

compelling them during the first winter of their lives to live on dry, innutritious food, with a bare handful of oats or a nubbin or two of corn to 'give them heart,' as the fogies say. Right there is the beginning of a colicky horse.

The Beginning of Much Colic.—In a large per cent. of the horses that are subject to attacks of colic the digestion was weakened in colthood, which renders them in after life dainty feeders. A hard drive, and they refuse a meal. A little excitement and physicking begins. Watered when a little warm, or exposed to a draught of air, and they have the colic. I think it can safely be said that fifty per cent. of the colic that exists among horses is due to a condition brought on in colthood by improper feeding. What, then, is the remedy? First, they must be fed upon a class of food that will as far as possible meet the conditions of the stomach in its impaired state and thus avoid indigestion, for colic is produced by the food not properly digesting. That is all there is of it, and all that can be done is to quiet pain and stimulate digestion and thus effect a cure, a prescription for which will be given below. For, my dear brother reader, I know full well if I give the prescription now, but few, if any, of you will read any other part of this article, and I want you to read what I believe will be of far more benefit to you than a prescription. People are always hunting for remedies, and rarely hunt for a cause of disease. But in this word lecture we are going to have our say and talk cause as well as cure.

Look for the Cause.—Cause number one of colic in horses, as before stated, is found in the owner compelling the colt to eat food like timothy hay for four, five or six months, with little or no grain ration like oats or wheat bran, which contain nutrition in a more concentrated form, and also in a form that is more easily digested and balanced in its chemical constituents. Oats are nearly a balanced ration in themselves for a colt or horse, just a little too concentrated, that is all. Timothy hay contains twice as much of the heat forming elements as is needed and only about half the muscle makers. Wheat bran is rich in these (called proteins), so let us feed bran two parts, oats one part, in quantities of about one pound of the mixture to every hundredweight of colt, and let the colt have what timothy hay it will eat, and as a rule it won't grow into a horse of colicky temperament and habit. If it be clover hay we have to feed, all the better, but don't, don't, don't try to make the little fellow wholly live upon it. It is too bulky, and although fairly balanced as a ration, too much of it will have to be eaten in order to get sufficient nutrition, and digestion is weakened in consequence. Feed the boy's remedy, oats, oats. There is nothing will take the place of oats and feed them in quantities of about half a pound to every hundred weight of colt, and then don't feed of the clover hay more than will be eaten in an hour's time. In fact, no horse should be fed at one time more hay of any kind than will be eaten in an hour.

Feed with Care.—Now we will drop the colt feeding as a primary cause and take up cause number two, of horses. Even horses that were well fed as colts can have their digestion weakened by bad feeding in mature life. Some horses

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can't eat corn at all, others cannot eat rye, wheat or barley. These grains when ground into meal are all by far too concentrated to feed alone, and when mixed with oats equally or even two-thirds oats to one of the corn, wheat, rye or barley, some horses' stomachs cannot well digest, and the result is colic. The farmer or man in town who buys mixed ground feed reasons in this way, and will often say when told that the feed is causing the colic in his horse, "Why, I feed it to all my horses, and they don't get sick." True enough, but all horses' digestions are not equal, nor alike, any more than people's. What is one man's food is another man's poison, and the same holds true in the feeding of horses. Many a horse is having frequent attacks of colic and many a horse has died with it, simply because the owner couldn't see that these mixed feeds were the cause. It is therefore the proper thing every time when a horse is taken with colic, if being fed on ground mixed feed, to change it to oats. But don't do like many do, change it from a full feed of ground feed to a full feed of oats. I have seen many a horse made sick by that change, especially if the oats were newly threshed ones. Always, when a change is made, drop to half rations and work gradually up to a full one.

When to Feed Grain.—Right here I must call attention to a practice that many indulge in, viz., withholding grain feed until severe labor is required. Then the grain is rapidly increased. The extra labor and the extra food combined many times cause indigestion. These are a few of the many causes of colic. Now let us briefly consider what goes on in the horse's stomach or first intestines in order to produce this trouble. Here again comes in the character of the food. A dry food produces an impaction of the alimentary tract, a green food excessively fed produces gaseous fermentation. It therefore is of great importance for us in the treatment, to first ascertain why and what has brought on the conditions. If it is a dry food and we have reason to believe the secretions have been dried up and there is a hardened mass of dry undigested food in the intestines, common-sense will tell us it needs to be removed. Therefore more is needed than opiates and stimulants. Physic is demanded.

Good Remedies.—Shall it be aloes? No, never. Why? Simply because aloes increases activity of the bowels by muscular contraction. Shall it be salts, either epsom or glauher? No. They increase the secretions of the mucous membranes and are so far good, but not sufficient to wet up that dry mass. What, then, shall it be? Oil, oil, oil every time, sufficient to soften up and emulsify this mass of dry food. "How much?" you say. I don't know. But start with a pint of pure raw linseed oil (never boiled). Give with a round teaspoonful of ginger, and if there is much pain add an ounce of sulphuric ether, or a half ounce of hydrate of chloral dissolved in water and added. In an hour repeat, and continue to repeat until there is a natural rumbling of the bowels. Also use the syringe by injecting a gallon of warm soapy water up the rectum, and repeat hourly until the pain succumbs or a passage is made. In bad cases wring cloths out of hot water and apply to the abdomen. This is a treatment for colic of this kind.

Now as to the other, the stomach was chilled by the class of food or too much water. Digestion is in a measure stopped, gases are formed by chemical action. Nothing will better neutralize the gas than a half ounce of carbonate of ammonia dissolved in a pint of water and poured down from a bottle. This will relieve the bloat and can be repeated hourly. Also if the pain is severe and no physician is present to use hypodermic injection of morphia, give the hydrate of chloral as before recommended with the ginger and repeat, if necessary, every half hour until the pain is relieved. These I do not lay down as the ideal treatments for the two kinds of colic mentioned, but give them as good cures and they will save the life of many a horse if given as recommended.

Another good remedy to be kept for immediate use is composed of equal parts tincture of opium, sulphuric ether and the spirit of nitre. Keep in a well-corked bottle. Dose, two tablespoonfuls given in a little water. Pour down from bottle. Repeat every half hour until the horse lies quiet and use hot fomentations to the abdomen.

Cases of spasmodic colic generally yield to the following treatment: Take of nitrous ether, one ounce; laudanum, one ounce, and mix well with ten ounces of water. This is the dose to be given to a mature horse, and may be repeated in one hour if the symptoms do not subside.

Bloody Milk.—Q.—What is the cause of a cow giving bloody milk? The cow is three years old, in good condition, first calf. Been milking three months; milk was good till four weeks ago.

A.—Bloody milk is produced whenever a blood vessel is injured in the milk gland and the blood escapes into the milk sinuses. This can occur very easily from a trivial cause for the reason that during the period when milk production is active the gland is in a state of physiological congestion. All its blood vessels are fully distended with blood and a very slight blow is sufficient to cause the rupture of some of the smaller ones or capillaries, and oozing of blood takes place. In treating this condition, anything which will reduce the activity of the milk gland will have a good effect in checking the production of bloody milk. A good dose of salts is therefore of much use in the beginning of such a case. In later stages, milk the teats affected only once a day and reduce the feed as much as possible.

Q.—I have a newly calved cow; about ten days after calving she commenced giving bloody milk from one teat. It is now over one week and she is no better.

A.—Get two or three ounces of belladonna ointment at the drug store and rub a little into that quarter of the udder twice a day. Milk out clean four times a day and don't feed much grain or bran until the udder is better.

Barrenness.—Q.—What can be done to get a mare, of 12 years of age, in foal?

A.—As you do not mention a single symptom that might give a clue to the cause of the trouble, I can only deal with barrenness in a general way and leave you to select the course of treatment you think most appropriate to this particular case. Professor Law enumerates the following causes of barrenness :—“(a) Imperfect development of the ovary and non-maturation of ova ; (b) cystic and other tumors of the ovary ; (c) fatty degeneration of the ovary in very obese, pampered mares ; (d) fatty degeneration of the excretory tubes of the ovaries (fallopian tubes) ; (e) catarrh of the womb, with muco-purulent discharge ; (f) irritable condition of the womb with profuse secretion, straining and ejection of the semen ; (g) nervous irritability, leading to the same expulsion of the male element ; (h) high condition (plethora), with profuse secretion and excitement ; (i) low condition, with imperfect maturation of the ovum and lack of sexual desire ; (j) poor feeding, overwork, and chronic debilitating diseases, as leading to the condition just named ; (k) closure of the neck of the womb temporarily by spasm, or permanently by inflammation or induration ; (l) closure of the entrance to the vagina through imperforate hymen, a rare though not unknown condition of the mare ; (m) acquired indisposition to breed, seen in old, hard-worked mares, which are first put to the stallion when aged ; (n) change of climate has been repeatedly followed by barrenness ; (o) hybridity, which in male and female alike usually entails sterility.” The impregnator is a small rubber contrivance for dilating the neck of the womb and is only useful in the cases comprised under the heading (k), but this condition of closure of the neck of the womb, if merely spasmodic, and not caused by disease, may be rectified by careful dilation with the fingers. The hand and arm are smeared with oil or vaseline, the fingers drawn together into a cone shape and carefully introduced. The projecting, rounded neck of the womb is felt when the arm has passed in about as far as the elbow. One finger at a time should gradually be pressed into it until the cavity of the womb can be felt. This should be done gently but firmly with a rotary motion of the hand, avoiding violence, which might tear the parts, as any laceration would tend to prevent the object in view, impregnation, from taking place.

Of the other causes enumerated, some are incurable, others amenable only to surgical operations, and some will themselves suggest the appropriate line of treatment. Fatty degeneration is combated by an albuminoid diet (wheat, bran, oats), and constant, well regulated work ; starch, saccharine and fatty foods should be avoided (wheat, corn, potatoes). “An irritable womb, with frequent straining and the ejection of a profuse secretion, may sometimes be corrected by a restricted diet and full but well regulated work. Even fatigue will act beneficially in some cases, hence the practice of the Arab riding his mare to exhaustion just before service. The perspiration in such a case, like the action of a purgative or the abstraction of blood just before service, benefits, by rendering the blood vessels less full, by lessening secretion in the womb and elsewhere, and thus counteracting the tendency to the ejection and loss of semen. If

these means are ineffectual a full dose of camphor (two drachms), or of salacin may at times assist."

Premature Birth.—Q.—Have a cow which lost her calf three weeks before time. Was getting plenty of good hay and water; stabled. Cow in good condition. What is the cause, and is the disease infectious?"

A.—Abortion is not always infectious, and in many instances will occur without any apparent cause. In the case of your cow, there is nothing mentioned that would be likely to induce it, but I would point out that this is not a case of abortion, but of premature birth. The difference is that in the latter case the foetus is sufficiently developed to live after birth, while in the former it is not. In bovine animals the foetus is able to do this when born thirty-five days too soon; and therefore a birth taking place within thirty-five days previous to the proper date of calving is not an abortion, but a premature birth.

Protruding Vagina.—Q.—What is the cause and what the cure of a mare that has a protrusion behind; it is about as large as a goose egg, and it only protrudes when the mare lies down. She eats well and works well.

A.—This protrusion of the internal parts when lying down is not uncommon in mares and cows, and is merely the result of a relaxed condition of the parts. It is not dangerous and does not call for any treatment. As a preventative, do not stable the mare on a floor with any decided slope to the rear, as that would have a tendency to aggravate the trouble. Occasionally a cyst may form in the wall of the vagina and protrude at times. It is distinguished by its tense elastic feel, and the fact of being confined to one side or the other. It may be cured by incision and calls for surgical treatment.

Removal of Afterbirth.—Q.—What is the best method for the removal of the afterbirth of the cow? Are any operations which may be necessary difficult or dangerous?

A.—Removal by hand is the safest and best method. The well-oiled hand, not a large one, is passed into the womb and the afterbirth separated from the womb by gently detaching the cotyledons from it. The cotyledons are spongy looking growths which project from the surface of the womb and are attached to it by a somewhat narrow neck. There are some hundred of these cotyledons and the afterbirth is attached to every one of them more or less closely. In removing it the cotyledon is grasped in the hand and the first finger and thumb are used to strip off the afterbirth. The difficulty of this is only in cases where the attachment is very close and firm, and when the more remote cotyledons are beyond the reach of the hand. The danger lies in the chance of an inexperienced operator tearing the cotyledon from the womb, when internal bleeding will result, or in leaving part of the afterbirth to putrify in the

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womb. If possible the operation should always be done by a veterinary surgeon, but in case of necessity the work can be attempted by an unskilled man.

Causes of Abortion.—The causes of abortion, apart from infection, are of two classes—the external and the internal.

The external are : 1. Sudden changes in the weather from heat to cold. 2. Bad food, such as is indigestible and liable to ferment in the stomach and cause formation of gas and pressure on the womb. 3. Bad water. 4. Poisonous plants and ergotized grasses and grains. 5. Excessive muscular exertion, nervous excitement. 6. Blows on the abdomen from kicks, hooks, falls, etc. 7. Standing on a much inclined floor for a long period.

Internal causes : 1. Diseases of the mother, such as tuberculosis or any wasting or febrile disease. 2. Disease of the foetus, such as hydracephalus (water on the brain), dropsy, etc.

Infectious abortion can only be distinguished from non-infectious by the fact that it spreads from cow to cow in a herd, and it is important, therefore, to treat every case in such a way as to minimize the danger of the disease spreading, in case it should be infectious. In a case of abortion it is a safe precaution, therefore, to burn the foetus, the membranes and the soiled litter, and isolate the cow for a couple of weeks from the rest of the cows in calf.

Anything which produces a sudden shock upon the pregnant animal through the sensory organs may induce abortion by reflex nervous action, consequently cows in calf should be protected from terrifying sights and sounds, and even unpleasant or unusual odors. The smell of blood is supposed to have a marked influence in this respect, as also the smell of a new-born foetus and its membranes. It is frequently remarked that when one of two or more cows in the same stable, and which are due to calve at about the same time, has produced her calf, the others will usually follow her example and calve within a few hours of each other.

Abortion is in some forms a contagious disease and spreads from cow to cow by means of the bedding, etc., soiled with the germ-laden discharges from a cow which has aborted. It may also be conveyed by an infected bull, and in various other ways. This form of abortion is comparatively frequent in Great Britain and on the continent and causes great losses to dairymen and breeders. In America it is a rare form of the trouble, but it is not unknown, and the safest plan in dealing with it is to treat every case as if it were an infectious disease.

How to Prevent Abortion.—It all depends upon how soon you notice the cow's condition. If she has already reached that stage when the foetus is dead and the membranes (afterbirth) are detaching from the womb, nothing can prevent the abortion, and it would be most unwise to try to do so. When this stage is reached, the waters have usually escaped, and there is something hanging from the cow behind. This

is part of the membranes, and when this is seen there is no hope of preventing abortion, and the sooner it is over the better for the cow. If, on the other hand, you are observant enough to detect that there is something wrong in the early stage, when perhaps the only symptoms may be dullness, loss of appetite, and perhaps the relaxation of the sacro-sciatic ligament, known to cattle-men as "dropping," you may be able by prompt measures to prevent abortion from taking place. The first thing to do is to put the cow in a box stall or quiet corner where she will be apart from other cattle and not likely to be disturbed. Give her a dose of medicine to quiet the nerves, such as bromide of potassium, one ounce, dissolved in a pint of water. Repeat the dose in six hours if necessary, and do not let the cow go with the other cattle until a few days have elapsed.

Should abortion occur, be sure and isolate the cow, and burn or bury the foetus, membranes and soiled bedding, and keep the cow apart from others until all discharge has ceased.

Epizootic Abortion.—This kind of abortion is highly contagious and spreads from animal to animal by means of the discharge coming from the cow before and after the expulsion of the foetus. Recent researches into the cause of the disease have discovered a germ or bacterium, which gains access to the genital passage of the cow, multiplies there and gradually invades the uterus or womb, when it causes the separation of the placenta (the membrane enclosing the foetus) from the womb. When the separation of the membrane has taken place, the foetus dies and is expelled by the contraction of the womb.

The disease has been successfully stamped out from herds of dairy cattle by means of careful hygienic and curative measures. The former consist in the isolation of all cases of abortion from among the rest of the herd, the burning of the dead foetus, membranes and soiled bedding, and the disinfection of the stable by lime wash and the liberal use of carbolic acid, or some other good antiseptic. Curative treatment consists in the careful washing of the genital parts of the cows every day with an antiseptic solution. For this purpose a barrel may be placed on the floor of the loft above the cows and fitted with a rubber pipe, with a suitable nozzle. The barrel is filled with a solution of corrosive sublimate in water in the proportions of 1 to 2,000, and each cow in turn has the vagina washed out with the solution. This treatment may entail a good deal of trouble, but it has proved successful in eradicating this plague from herds which had been troubled with it for years, and in which other so-called curative treatments had been tried in vain.

The Bull and Abortion.—It has been found that the bacteria or germs which cause infectious abortion may remain in the genital organs of an infected cow for a long period, and may by means of the bull be transferred to other females. No symptoms are produced in the male and

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it is not known whether he plays only a passive part in conveying the infection from female to female, or not. In any case, where a bull has been used on an infected female, he could not be used with safety on another for a considerable time, but it is impossible to say how long; it might be a matter of a few days only, but possibly of weeks. Our present knowledge of the disease is very incomplete on these points.

Leucorrhoea.—Whites.—Q.—1. I have a mare that last winter appeared to be always in season, was served twice by a horse this spring, and now is continually straining and passing water in small quantities; is getting very thin and weak, but eats heartily and is fairly keen. **2.** Mare served soon after No. 1, discharged white matter for a time, then quiet for nearly a fortnight and then started again. Think it is the whites.

A.—Both mares are suffering from leucorrhoea, which is a difficult trouble to cure by medicine alone, and success is seldom attained without local treatment. This consists in washing out the vagina with an antiseptic solution once or twice a day. To do this properly requires a suitable apparatus, and this is not often available at a farmer's establishment. An injection pump and about six feet of rubber hose with a nozzle is the proper appliance to use, but an efficient substitute can be manufactured out of a pail and some rubber hose. The hose is to be fastened to the bottom of the pail in such a way that the fluid in the pail will run out through the hose when permitted. This apparatus is used by filling the pail with the fluid, then inserting the end of the hose in the vagina, raise the pail a foot or two above the mare's back. The fluid will pass gently through the tube and irrigate the diseased mucous membrane effectually.

The solution to use consists of creolin one part, warm water, one hundred parts. This is a little more than a tablespoonful to a gallon, and a gallon at least should be used for each injection.

In addition to this local treatment, feed the mare liberally, and give her twice a day in her feed a teaspoonful of fluid extract of *hydrastis canadensis*.

A.—Your mare is affected with leucorrhoea and until she is cured you may not be able to get her in foal. This is a catarrh of the vaginal passage and will require local as well as general treatment. Get a large syringe and wash out the vaginal passage once a day with the following lotion:—Fluid extract of *hydrastis canadensis*, one ounce; warm water, one quart. Give her in her feed twice a day a tablespoonful of the same fluid extract.

Swollen Udder.—Q.—What is the best thing to use to take down the hard swelling in a young cow's udder, as ours are coming in very much swollen?

A.—Milk frequently, gently and thoroughly. After milking rub the udder for some time with camphorated oil and goose oil in equal parts. If the udder is inflamed and pain-

ful, hot water bathing should be used several times a day in addition to the hand-rubbing.

If anything should cause an udder to become swollen and inflamed, give the cow at once one pound of Epsom salts, bathe the udder thoroughly with hot water twice a day at least. Rub gently and thoroughly after each bathing with soap liniment. Rub until dry. Give another dose of salts in a few days. Clean the udders thoroughly before milking. This not only keeps the milk clean, but saves many sore teats. If the teats become sore apply common vaseline. This may save you a pail of milk.

Lump in Udder.—Q.—I have a newly calved cow which has a lump growing in her udder right above a teat, which is very sore when touched. I am afraid that that teat will go blind.

A.—Keep the cow well milked out, using a milking tube if the teat is too sore to handle. Foment with hot water twice a day and afterwards rub in a little of the following ointment: Iodide of potassium, three drachms; lard, two ounces.

Garget.—The causes are irregularities of diet, over-feeding on stimulating food, exposure to cold, external injuries, etc. It seldom attacks the whole udder. The part attacked shows swelling, heat, pain and redness. The milk is curdled, whey-like, and mixed with blood. Remove cause. Reduce milk-making food. Draw the milk frequently, using a milking tube if necessary. If the weather is warm bathe the udder for an hour or more with hot water. Take fluid extract of belladonna, 1 oz., glycerine, 2 ozs.; mix and apply three times daily with mild friction. Give two teaspoonfuls fluid extract of belladonna three times daily. If constipated, give Epsom salts, 1 lb.; ginger, 1 oz.; water, 1 quart.

Milk Fever.—This dreaded foe is better met by preventative measures than any after treatment. If a cow is inclined to have milk fever, give her light diet a week or more before and after calving. Keep her bowels open, if constipated; in fact, it is a good plan to give several doses of salts before and after calving. Most danger lies with cows on flush of pasture or very heavy feeding. The treatment consists in giving a dose of salts, applying mustard paste along the spine. Blanket and keep warm. Give injections of soap and warm water. Internally give one half-pint of whiskey every three hours.

Stoppage of Teat.—Q.—Milch cow's teat became almost closed up by a small hard lump and was very sore. That quarter of the udder gradually hardened until only a few teaspoonfuls of lumpy milk could be extracted. Rubbed well with electric oil. It is getting better again except that it gives a smaller quantity of milk. Six weeks previous to this the teat was cut pretty deep with barbed wire, but

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Things Worth Knowing.

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steadily healed over. What should have been done? Will it be likely to affect her again in the future and is the milk quite wholesome now?

A.—The lump in the teat should have been incised by a concealed bistoury, or "teat knife," and the opening kept from closing again by daily passing a silver tube into the teat. If the growth is permanent the same trouble will recur when she is fresh in milk again. The milk is probably wholesome, but a positive opinion on this point is impossible without examining it.

Scours—Diarrhoea.—Diarrhoea in calves results from several causes, the most important being feeding by hand on milk that is cold and stale. Under certain conditions the milk of the mother may become unwholesome and cause diarrhoea. Another cause is found in unhealthy stables, deficient in cleanliness, ventilation and drainage. One fact seems well established in connection with the diarrhoea of calves. It is the infectious nature of the disease. Cases are on record where every cow calving in a certain byre has lost her calf from "the scours," and as a preventative the first case occurring on a farm should be kept apart from the other calves until cured. Treatment consists in careful dieting and administration of medicine. Milk should be boiled and given in small quantities at regular intervals. The following draught is useful in checking the discharge: Diluted sulphuric acid, 30 minims; tincture of catechu, 2 drachms; spirits of chloroform, 30 minims. Give three times a day in half a pint of starch gruel.

In treating diarrhoea in young calves it is well to remember that it is frequently the result of an effort of nature to get rid of irritating matters in the intestinal tract. These may result from indigestion, and this, in turn, be caused by something unwholesome in the food or surroundings. The stable or stall in which the calves are kept should be kept scrupulously clean and sprinkled with chloride of lime. If the calves are sucking, see that their mothers are healthy (no inflammation of the udder), and the food wholesome and suitable. For curative treatment begin by giving each calf from one to two ounces of castor oil, according to size. When that has operated, give to each one, three times a day, one drachm of nitrate of bismuth, fifteen grains of salol, and one drachm of precipitated chalk. This is to be shaken up in half a pint of linseed gruel and given from a bottle. In some cases it is necessary to take the calf from the mother and feed it by hand on boiled milk, giving a tablespoonful of lime water in it at each feed.

Q.—Kindly tell me what to give my horse, aged six years, which scours badly in the morning after eating, but gets better towards noon. He is a good feeder, but eats his meals very fast. I am feeding whole oats and good hay, with a little oat straw and oat sheaf at noon. He is in good condition, but a little dull in his coat. Would it be better to have his oats chopped?

A.—You should either feed him crushed oats or else get a slow-feeding box for him. Don't feed any straw or sheaf oats to him. A few doses of sulphate of iron and bicarbon-

ate of soda will do him good, a small teaspoonful of the former and tablespoonful of the latter in the feed twice a day.

Chronic Diarrhoea.—Q.—One of my oxen, as soon as I work him a little, takes diarrhoea, and consequently gets feeble. He has very little appetite. What would you advise as treatment? He is about 11 or 12 years old.

A.—Procure from a druggist the following powders:—Powdered galls, 8 ounces; powdered gentian, 8 ounces; powdered sulphate of copper, 3 ounces. Mix together and give a large spoonful twice a day in a gallon of chopped oats or corn. Do not feed bran or shorts. See that the hay is good quality upland hay, not swamp grass.

Q.—I have a cow, five years old, also an ox, seven years old; both are ailing from the same complaint, that is, they have got very thin, manure is very soft and runs like diarrhoea, gives bad smell in stable, fed on nothing but hay.

A.—Diarrhoea is usually the result of improper food or drink, and if the hay is of good quality and the water pure, it is difficult to say what is the cause. Possibly it may be tuberculosis, which will produce diarrhoea when it attacks the liver or bowels. You might try the following powders: Carbonate of ammonia, 2 ounces; powdered galls, 6 ounces; ginger and gentian, of each 2 ounces. Divide into twelve doses and give one three times a day in a bottle of gruel.

Don't Spend Time in Trying to Cure

Tuberculosis, for up to the present time no satisfactory remedy has been discovered. If you suspect some of your cattle to be suffering from the disease, have them tested by a competent veterinarian at once.

Glanders is so very contagious, and cures are so rare, that treatment is not recommended unless the horse is a very valuable one. This disease is sometimes communicated from the horse to man, sheep and dogs, but not to cattle.

Heaves.—This is something like dyspepsia, and requires different treatment in different animals. It is difficult to cure under any circumstances. It can be relieved to some extent by avoiding those articles of food which seem to aggravate the disease in any particular animal.

Hog Cholera.—It is very difficult to distinguish between this disease and swine plague. In most cases the cost of treatment is greater than the worth of the animal, and a cure is not often effected.

To find area of a circle—multiple square of diameter by .7854.

To find content of a cylinder—multiply area of base by the height.

DAIRY.

Clearing Foam From Separator Skimmed Milk.

Although a good deal can be said in favor of the use of separator milk for calf-feeding, some farmers have lost valuable animals by feeding milk covered with foam, just as it came from the separator. J. H. Farthing, Millwood, Man., gives the following solution: "Here is my way out of the difficulty. Run the skim-milk into a shot-gun creamer with a tap on it, and from this carefully draw through the tap into the feeding pail. If reasonable care is taken in doing this, the foam is left in the creamer, and this can be diluted with water, mixed with the pig feed, and no harm done, and nothing wasted."

This question was discussed at the dairy convention, February, 1900. Mr. Lutley, of the Dairy School, contended that the foam was caused by allowing the skim-milk to fall too far from the delivery tube of the separator. If the vessel receiving the skim-milk was set close under the outlet so that the skim-milk would have the least possible distance to fall, the most of the difficulty would be obviated.

Change Rubbers in Cream Separators.

When the separator bowl runs unsteadily or vibrates it is an indication that the neck-bearing rubber ring has become spongy and soft, and should be renewed at once. It is always best to keep a small extra supply, as the rubber rings should be changed about every four months, or when they get soft and don't hold the bowl firmly. The separator must set perfectly level and run smoothly to perform its mission.

Dairy Briefs.

Milk should be thoroughly strained and set immediately after it is milked, while it is warm from the cow.

The temperature of setting should at least be to 90 degrees Fah., and a few degrees above that temperature will be all the better. The warm milk should be set in ice water, 40 degrees, the colder the better to give the best results.

Many buttermakers spoil otherwise good butter by overworking.

Do not wash the butter more than just what is required to get out all the buttermilk.

As soon as separator skimming is done, cream should be cooled as quickly as possible to 40 degrees.

The average requirement of our market demands about three-quarters of an ounce of salt to each pound of butter taken from the churn.

It is very important that butter never be churned past the granular stage, for if the grain is broken the product is greasy—a very undesirable condition.

Every dairy should possess a cream strainer, buttermilk strainer, brushes for scrubbing, thermometer, a small set of scales, a good churn, and, if of any size, a separator.

Should milk become cooled before setting, it should be warmed at time of setting to 90 degrees. This may be done by the addition of warm water at 120 degrees, adding about ten per cent.

Never attempt to make a batch of butter without a thermometer; it is a never-failing guide all through the process of butter making, from the separating of the cream to the working of the butter, and even in packing it should be used.

The use of cheap salt spoils many thousands of pounds of butter each year in our Canadian West. As the cost of good salt is comparatively small, it is poor economy to sacrifice twenty pounds of butter for the difference in price on one pound of salt.

Butter color does not improve the butter in any way except in appearance. Usually about $\frac{1}{4}$ to $1\frac{1}{2}$ drachms of color to the cream of each 100 pounds of milk is sufficient to give the proper tint. Always add the color, if using it, before the churning has commenced; never after, even if the churn has made but a few revolutions.

The temperature of the cream, when it is ready to churn, should be from 56 to 58 degrees Fah., but never above 58 degrees, during the spring, summer and autumn months, and from 60 degrees Fah., to 62 degrees Fah., but never above 62 degrees, for the winter months. It is imperative that a thermometer should be used to reveal the temperature.

An Imperial gallon is 277.274 cubic inches capacity.

A cubic foot contains very approximately $6\frac{1}{4}$ Imperial gals.

To find circumference of a circle—multiply diameter by 3.1416.

Nails dipped in dissolved soap or in oil will drive easily in hard wood.

The number of farm laborers employed in Manitoba in June, 1900, was estimated at 8,700.

The wheat of the West yields, according to Prof. Ladd, of North Dakota, 20 per cent., or one-fifth, of its weight in bran, and six and two-thirds per cent. of its weight in shorts.

POULTRY.

Preserving Eggs.

The best way of preserving eggs for winter use is always a question of interest. In a recent examination before the Dominion Committee on Agriculture, A. G. Gilbert of the Central Station at Ottawa, gave the results of experiments made by himself and Professor Shutt on the respective merits of waterglass (silicate of soda) and plain lime water. The waterglass was applied in a ten per cent. solution. Tests were made of varying periods of time in the solution and the eggs so treated were put in a rack inside a drawer where the temperature ran from 65 to 72 deg. F. A set of untreated eggs was used for comparison. The waterglass is the most expensive application and after continuous tests these two experts agree that lime water is the best for all practical purposes. The eggs should, of course, be quite fresh when put in the lime water. Professor Shutt's recipe is as follows:—Three or four pounds of good fresh lime in five gallons of water stirred well at intervals for a few hours and then allowed to settle. The clear water may then be poured over the eggs, which have been previously placed in a crock or watertight barrel. Mr. Shutt thinks the addition of a pound or so of salt, which is sometimes recommended, unnecessary indeed, it might lead to the imparting of a limy flavor to the egg by inducing an interchange of the fluids within and without the egg.

The experiment shows the following two points to be all important, namely:

1. That perfectly fresh eggs are put in the liquid, and
2. That they shall be covered with the preservative fluid, so as to prevent evaporation and consequent shrinkage of the meat.

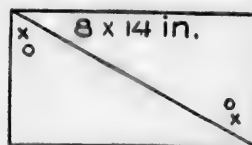
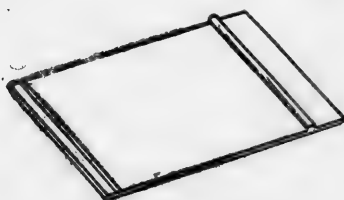
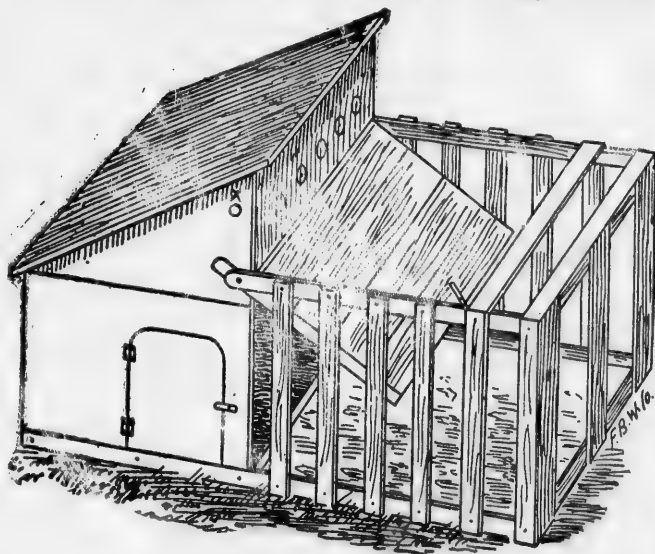
The following recipe is also said to give excellent results: Take 1 lb. quicklime, 1 oz. cream of tartar, 6 ozs. common salt. Pour on to these ingredients six quarts of boiling water, and put in the eggs next day, when cold, and leave them in, taking them out as required.

Length of Setting Period.

Hens sit 19 to 24, generally 21 days; turkeys and peafowls, 26 to 29 days; geese, 28 to 33 days; ducks, 28 to 33 days; pigeons, 18 days from last egg; canaries, 13 days from steady sitting.

A Convenient Coop.

The coop is made of lumber 12 inches wide; ends and back 20 inches wide. Take 12-inch board 20 inches long, saw it from one corner to other. This makes gables and gives 20-inch height in front. To make the front solid nail 2-inch strips on inside of front from gable to bottom. The roof is made to fasten on with hooks. The bottom also is loose. The lid in front is made by cutting boards 20



Complete Hen Coop, and Some of Its Parts.

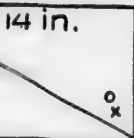
inches long. Nail strips half-inch thick, $2\frac{1}{2}$ inches wide, 22 inches long on each end; nail them so that when the lid is let down half-inch will lap over end, making lid 20 inches high. The ends of strip projecting over at top are to fasten to coop with screens. This lid makes part of cover to run when raised; it closes front of coop when let down. The run is made of lath. The sills are four feet long on each

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side. Nail them on each side of coop at bottom. Make the run wide enough so that it will fit on outside of coop at top. The screens that hold on lid to front of coop should first pass through cleat at end in top of run. This lets the lid work freely inside of run. Make holes in front of top and ends for ventilation. To move the coop let the lid down in front; step inside of run, and you can carry it to fresh ground every day. The advantages of the coop are: It gives the hen fresh ground and sunshine; a place to wallow if dry; keeps rats out; it is easily white-washed by taking roof and bottom out.

Simple Contrivances for Testing Eggs.

Testing eggs is now an art that can, with a little practice, be very accurately done by any farmer. Although most important in connection with the incubator, it is almost equally so when eggs are under the hen; all infertile eggs



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Egg Tester, showing Germ in Fertile Egg on Seventh Day.

can be removed and used as feed for young chickens, whereas, if left in the nest, they only become rotten and are wasted. Then, again, where two or more hens are set at the same time the eggs can be tested and all fertile eggs put under one or more hens and the other hens set again.

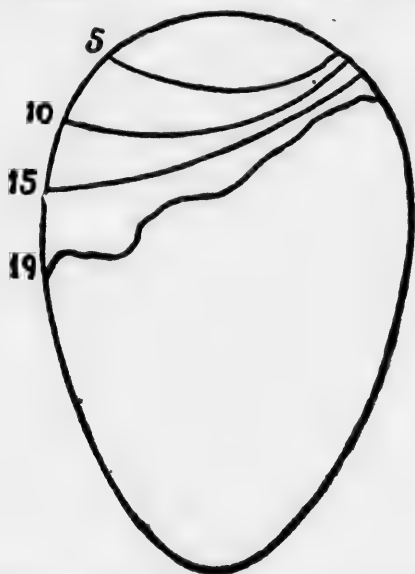
With an egg-tester like that shown in the illustration eggs can be tested in a dark room quickly and very accurately. It is only a small lamp with a tin chimney having an opening at the side with a layer of felt cemented around it and against which the egg is held.

The illustration shows the starting of the germ, or how a fertile egg looks on the seventh day.

The general plan is to test the eggs on the seventh and again on the fourteenth day, but white-shelled eggs can be

tested on the fourth day quite as accurately as the dark-shelled ones can be on the seventh day. When held against the light in a darkened room, with the big end up, a fertile egg should show a spider-shaped object inside. This indicates a perfect germ, which, if given proper treatment, will bring out a chick. If, however, the eggs seems perfectly clear, when held to the light, it is infertile and should be taken out. These eggs are perfectly good and can be used in the house. Sometimes a germ starts and then dies. In such a case a black speck will be seen without any veins to it, or a ring or half-moon of red will be seen; all these should be removed and can be mixed with the feed for growing chicks.

As incubation proceeds the eggs become darker, and on the fourteenth day the chick can be seen to move. A test then will show any that have died since the first test was made. If the germ is found to float when the eggs are turned, and no veins can be seen, it is dead, and such eggs should be removed.



Showing Increase in Air Space on 5th, 10th, 15th and 19th Days of Hatching.

Besides the germ, the air cell at the large end of the egg furnishes some idea of the changes that are taking place. A fresh egg only shows a very small air space, but this gradually enlarges as incubation proceeds. The next illustration shows how an air cell looks on the 5th, 10th, 15th and 19th days. Care must be taken to keep the eggs warm while testing them. A little practice will soon enable one to become quite accurate in testing. It is always well to turn the eggs around while held to the light.

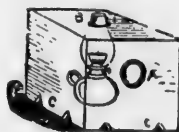
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Expert's Method of Testing Fertility of Eggs.

Experts can sometimes tell quite accurately whether an egg is fertile or not by holding it up to the flame of an ordinary lamp in a darkened room. The egg is held with the left hand and the top of it shielded with the right.



An Easily Made Egg Tester.

Any smart boy on the farm can make a cheap and good egg tester as follows: Take a box about one foot square and the same in height or high enough for the lamp chimney to come up through a hole in the top about an inch, as shown at B. The hole at A is the size of an egg, and around it is fastened a thick layer of cloth or felt, so arranged as to fit closely against the egg. The openings at C C are to let in air to the lamp. If a suitable box is not at hand one can be made of almost any kind of lumber or even pasteboard.

In testing eggs, remember that a good egg will sink and a bad egg will swim; if it is difficult to remember which is which, just stop to think that a fresh egg sinks because of the water in its own composition.

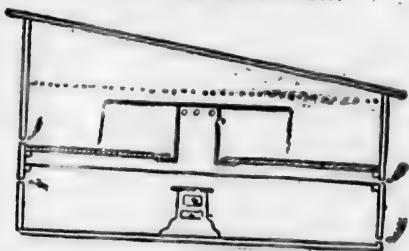
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A Home-Made Brooder.

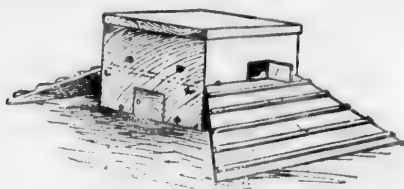
Any farmer's boy handy with tools can make a good brooder for young chicks. The following description gives a good idea of how to make a reasonable one:—

The cut shows the lamp below a sheet of iron that securely shuts off the lamp chamber from the space above. Bed the sheet iron in white lead to make it air tight. Above the sheet iron the floor is of matched stuff, and in the centre is a 5-in. drum opening into the space between the floor and the sheet iron. Around the top of the drum are openings that let the hot air out into the brooder. The top of the



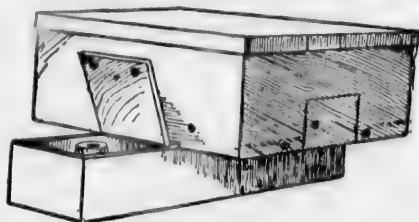
drum extends for 10 inches all around the drum, and from the outer edge a flannel curtain is hung, inclosing a circular space with the drum in the centre. The curtain is "slashed" up every 3 inches. The dotted line shows where the cover can be placed for an inside brooder. If it is to be used out of doors it must have a sloping cover. Put two lights of glass either in the cover or in opposite sides.

Not more than 50 chicks should be placed together when hatched, and two weeks later not more than half this number should be brooded in one lot. For 50 chicks just hatched, the brooder should be three feet square and the sheet iron top of the cover should have a diameter of 20 inches. The ventilating holes are one inch in diameter. Cut rectangular openings in the sides and fit glass to the inner and outer edges of the openings. This will give tight double windows. A small oil stove could be used for this brooder, but the regular brooder stoves that can be bought from any poultry supply house are better.



Chicks persist in running under the incline. To obviate this, have an incline all around the brooder as suggested in

the second illustration, one side of the incline being removed to show the plan more clearly. Another plan is shown in the third illustration, where the lamp box is narrow and extends in front of the brooder. A narrow trench can be dug in the ground for the lamp box, bringing the brooder



proper down level with the ground, so that the chicks can run in and out at will. Put the lamp in at the front and push it along under the middle of the brooder. Then close the cover in front. The lamp chamber must be ventilated in front and at the rear by two holes at each point.

A Drinking Fountain.

A convenient drinking dish that will prevent the chicks from diving into the water and splashing it around is made by taking a tin can, remove the top and cut two small holes on opposite sides about three-quarters of an inch from the edge. Fill the can with water, place a flower pot



saucer over it, and turn it over quickly, the water will come out the small holes until it is on a level with the top of them. This makes a convenient dish for adult fowls; but for them the holes should be cut two inches from the edge, so the water will stand about two inches deep in the saucer.

It has been computed that there will be over 1,000,000 living seeds in a pound of good timothy seed, or about 25 per square foot if sown on an acre of land. The smallest seeding per acre we have heard of here is 3 lbs., and some seedsmen recommend as high as 20 lbs.

How to Fumigate a Poultry House.

The poultry keeper who whitewashes his hen house four times a year need have no fear of its becoming infested with insect vermin, nor will it be necessary for him to fumigate it, as there will be no object in doing so since there will be no insect life to destroy. The owner of a poultry house that needs fumigation should set about it in the following way:—Remove all nests, perches, and everything that is portable. Put a pound of sulphur in an iron pan with some burning coals in the middle of the house. Then close up the doors, windows, and all other openings, and let them remain so for two or three hours. Afterwards paint the roosts and nest boxes thoroughly with coal tar, and whitewash the house both inside and out with lime. A spraying pump is very useful to get the limewash into the crevices in the roosts and walls, and it is beneficial to add some carbolic acid to the limewash. Once a house is thoroughly freed from vermin it is easy to keep it so by attending to it regularly and taking the precautionary measure of frequent limewashing.

Diarrhoea.—Check by giving boiled milk to drink and dry food.

Pip.—A condition of the tongue accompanying diseases when the bird is obliged to breathe through the mouth; treat the disease; wet the tongue frequently with glycerine.

Frost Bite.—To combs, apply two or three times a day a mixture of vaseline, five tablespoons; glycerine, two tablespoons; spirits of turpentine, one teaspoon. When the feet are badly frosted, kill the bird.

Gapes.—Gape worms in the windpipe. Place the birds, a few at a time, in a large box covered with coarse cloth and having a door in the side; dust air-slacked lime in the cloth. The lime breathed in by the birds causes the worms to relax their hold, and they are coughed up.

Scaly Legs.—Caused by a mite which burrows under the scales of the feet and shanks. The crusts can be loosened by soaking in warm, soapy water, or by a vigorous brushing with an old tooth or nail brush. When they have been removed apply a sulphur ointment or a mixture of lard and coal oil.

Colds.—Give aconite in the drinking water. Another good remedy to keep on hand ready is: Equal parts of cayenne pepper, ginger and mustard mixed as stiffly as possible in lard, then flour worked in to make a stiff dough; form into slugs or pellets about the size of a small hazel nut; give by opening the mouth and dropping down the throat. A single treatment often cures; if it does not, follow by another dose in 24 hours.

House.

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THE FARM.

Weight per Bushel.

Following are the commercial weights per bushel in general use in this country. The legal weights in some cases differ from the figures here given, but in business such variations are usually disregarded. To avoid such cases of misunderstanding, and for greater convenience of computation, the "cental system," i. e., the quotation of prices by the pound or hundred pounds, is coming into use.

Barley	48	Millet (German)	50
Beans	60	Millet (Hungarian)	48
Brome Grass	14	Oats	34
Buckwheat	48	Orchard Grass	14
Clovers of all kinds	60	Peas	60
Corn (shelled)	56	Potatoes	60
Corn (in the ear)	70	Rye	56
Corn (sweet)	46	Sorghum	50
Flax	50	Timothy	48
Millet (common)	50	Wheat	60

Vitality of Seeds.

The following seeds, if properly kept, may be safely planted up to the ages mentioned. If the seed is older, only a portion of it will grow, and the resulting crop will have less vigor.

Barley	3 years	Oats	3 years
Beans	3 years	Peas	4 years
Buckwheat	2 years	Rape	5 years
Clover	3 years	Rye	2 years
Corn	2 years	Timothy	2 years
Flax	2 years	Turnip	5 years
Millet	2 years	Wheat	2 years

The estimated area, in acres, sown to crop in Manitoba in 1900 was: Wheat, 1,806,215; oats, 572,950; barley, 178,525; flax, 20,437; rye, 2,486; peas, 780; corn, 1,309; brome, 5,076. A comparison shows 2,612,134 acres in wheat, oats and barley as against 1,082,006 acres in 1890.

Seed per Acre.

Following are the amounts usually sown :—

Wheat	1½ bu.
Barley	1½ bu.
Brome	10 to 15 lbs.
Buckwheat	½ bu.
Flax (for seed)	½ bu.
Flax (for fibre)	2 bu.
Millet (for seed)	½ bu.
Millet (for hay)	½ bu.
Oats	2½ bu.
Orchard Grass	2 bu.
Peas	2 bu.
Potatoes	10 bu.
Rape, in drills	1½ to 2 lbs.
Rape, broadcast	4 lb.
Timothy	6 lb.
Western Rye Grass	8 to 10 lbs.

Measurement of Hay.

Good timothy hay, not too ripe, in a bay fourteen feet or more deep, or of less depth with grain above, will average for the mow about five hundred cubic feet per ton. Finer hay is heavier. Hay cut when nearly ripe, is lighter than that cut green. Hay in a stack usually occupies a little more space per ton than in a well filled mow. On a scaffold or in a shallow bay at least six hundred feet of good timothy will be required for a ton. Clover hay is much lighter than hay from the grasses, usually requiring from seven hundred to eight hundred cubic feet for a ton in a well filled mow, or somewhat more if in smaller bulk. There is much guess work in measuring hay, especially so in a stack where the length of time it has stood makes a big difference to the weight per cubic foot.

Shrinkage of Farm Products.

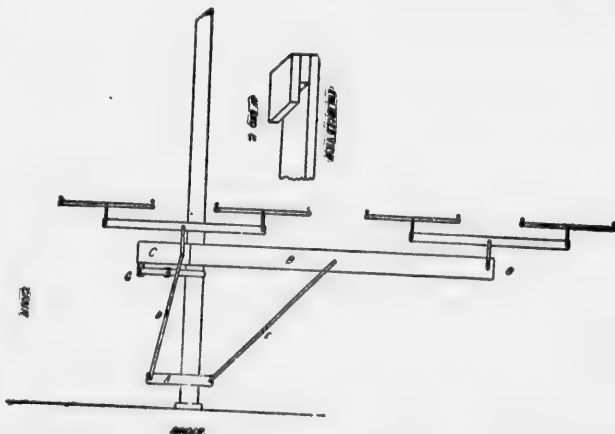
Hay properly cured will shrink in weight between the time it is put into the mow, and the following spring, about one-fifth.

Wheat and other grains which mature in mid-summer, and which are allowed to sweat in the stack or mow, before being threshed, will shrink in weight very little thereafter.

Potatoes stored in a cellar often lose heavily in weight, and somewhat also in bulk, by the escape of moisture. When stored in a pit there is little loss, except by rot or freezing. The loss is much more marked after warm weather has set in, and sprouts are allowed to grow.

Three and Four Horse Eveners.

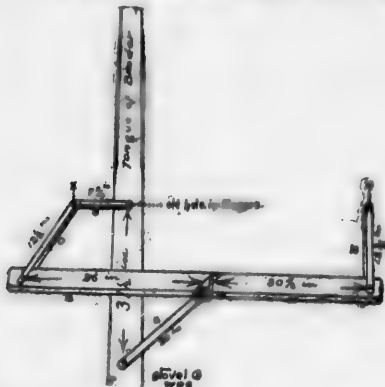
A four-horse evener for the binder may be made as follows:—In the illustration A is a piece of two-inch bar iron, 15 inches in length, and is bolted to the tongue as near to the binder as possible, 10 inches long on the grain side and five inches on the other. B is a 2x5 oak scantling 6 ft. 6 in. long, placed across the tongue, but not fastened to it. C is a stay 12 inches long and bolted to B, two inches from G end. The holes in C are 10 inches between centres. It is raised above B at G end by a block an inch or more in thickness (as shown in the enlarged view of G end) in order to allow of the free play of the two iron rods D, which are each 28 inches long. One end of each of these rods is bolted to A and the other end to the inner end of C. (It will thus be seen that C really doubles back on B and is raised a little at the outer end of B at G). The doubletree clasps and the two rods D are all fastened by one bolt. E repre-



sents two iron rods 34 inches long, bolted at one end to B at a point 29 inches from the end O, and at the other end to A, one above and one below. To hold the whiffletrees in their proper place on the tongue a staple is driven into B at G end, a stout leather strap is passed through this staple and buckled around the tongue. This strap adjusts the side draft. It should not be given a lap around the tongue, but the whole thing should be loose so that all strain comes directly on the iron evener.

Another Evener.—Directions for Making.—Remove all three-horse attachments. Now bore a hole $31\frac{1}{2}$ inches back of the original draw hole in the tongue. In this is bolted the rod B, which is 30 inches long and forked at the end, where it unites with A at a point $30\frac{1}{2}$ inches from the right hand end and 36 inches from the other end. A is the dou-

ble eveners, 6 ft. long and of 2x5 material. C is a short strap bolted to the tongue in the old draw hole and is 7½ inches long. D are double iron rods uniting with C at X, one below C, the other above one pair of the ordinary dou-



ble-trees which go on here. The one bolt fastens all together. E is also a pair of rods, 12½ in. long, and at X the other double-tree goes in. D and E should be heavy band iron. The other two require to be strong, old waggon tires will do. The fork in the end of B should be about 10 inches deep. All measurements are from centre to centre of holes, to make allowance for ends. The two pairs of double-trees are fastened at the point marked X.

The Manitoba Grain Act.

This Act was framed by the Dominion Parliament mainly to provide against disputes between buyers and sellers at public grain warehouses within the Manitoba Inspection District. A copy of the Act is supplied to every person licensed under its provisions. A large placard containing a copy of the Act is also supplied by the Commissioner, to be put up in a prominent place inside each warehouse, so that every person delivering grain can there learn for himself all its provisions. It is therefore unnecessary for us to reproduce it here. But we may explain with reference to Section 55 that even from cleaned wheat the warehouseman is entitled to deduct from such net weight an allowance for "shrinkage," due to loss in handling, averaging about 1 per cent., but that deduction must be noted on the ticket supplied to the seller.

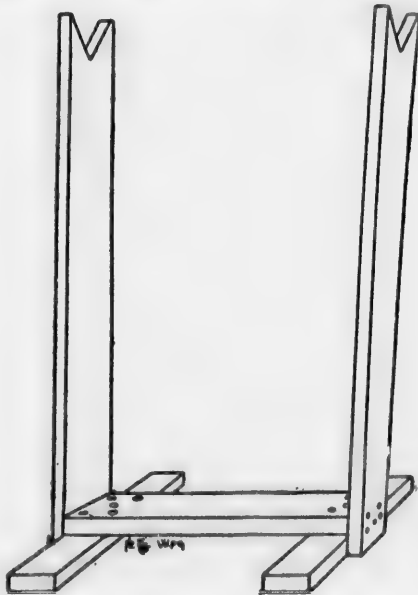
One day's work with a team and cultivator will do as much good to the crop as if you spent a whole week going over the field with a team and water sprinkler.

To Thaw Out a Pump.

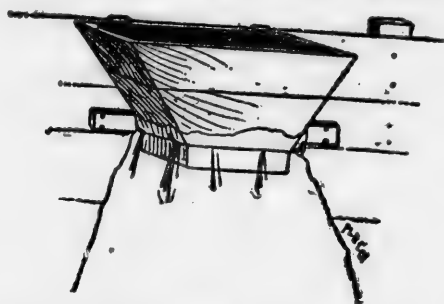
If it is an iron one, tie a rag moistened with kerosene round it just a little below the spout and set fire to it. If it is a wooden pump an old blanket soaked with boiling water will do the job, but much more slowly, as the wood is a very bad conductor of heat. Just for that very same reason the old blanket wrapped around it dry will do much to keep the frost out of a wooden pump. Prevention is always better than cure.

Convenient Bag Holders.

Where some kind of a patent bag holder is not in use upon the farm, a cheap and convenient one may be made, as shown in the accompanying illustration. The device is so simple that anyone can see how it is made. The upright boards should be seven inches wide and cut the length to suit your bags. Two scantlings with a plank nailed firmly across, as shown in illustration, are better as a base than a solid plank, as they adjust themselves more readily to any unevenness of the ground. The whole should be solidly nailed or screwed together in such a way that the tops of the upright boards must be sprung together to receive the



bag. The tops of these should be cut slightly V-shaped, as shown. The entire cost is about 15 or 20 cents.



The second illustration shows how another very convenient bag holder can be made, for use in the barnyard. It is not quite so easy to make as the other, but any farm boy accustomed to the use of tools can soon make a very serviceable one.

To Subdue Weeds.

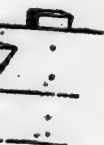
1. Keep uncultivated land seeded to grass so that it may be either mown or pastured.
2. Keep some crop on the land all the time. Rye is good to occupy the land in the latter part of the season.
3. Avoid introducing weed seeds in grain or other material purchased from abroad.
4. Make special effort to exterminate any new weed that appears.
5. Be sure and properly clean all seed by the fanning mill before sowing.

Insects in Stored Grain.

For insects of all kinds infesting stored grain, the best remedy is bisulphide of carbon, a heavy fuming liquid which can be purchased of any druggist for a few cents an ounce. Pour the liquid over the grain at the rate of, say, four ounces for a bin holding one hundred bushels. Cover immediately with a blanket to keep in the fumes. The vapor is heavier than air, and will sink into the grain and penetrate all parts of the bin. Bisulphide of carbon is very inflammable and explodes violently when its vapor is ignited. Care should therefore be taken to have no fire of any kind in the vicinity where it is being used.

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The Way in Which Smut Grows.

Considerable misconception has existed as to the nature and growth of the smut plant among our crops. It is therefore of interest to some to learn that smut is a plant just as truly as the wheat or the oat or the potato is a plant, and when its seed is sown the resultant plant will be grown. The wheat berry is the seed of the wheat plant, and the smut ball contains millions of the seeds of the smut plant or the black powder on the heads of the grain is made up of innumerable seeds of the smut plant. But each seed is so small that it is invisible to the naked eye and has to be magnified many times to be seen. But unlike wheat, it does not grow in the ground. It does not send out roots and gather food from the soil to support itself. It germinates when the wheat grain does, enters its soft mass and grows there. As the wheat stalk grows up in the air the smut plant pushes up its branches, too, inside the wheat plant. The smut plant has no true roots, but sucks its food from that prepared by the wheat plant. It is a parasite. It allows the poor wheat plant to go on growing, to send up a head and try to produce seed, but it has so drained the wheat plant of the store of food that it has laid by for forming seed that the wheat plant is unable to do so. Then the smut plant gathers up the store of food it has robbed the wheat plant of and uses it to form its seed, but it is smut not wheat, and no use to man—unless it is to teach him to bluestone, or formalin, his seed, and thus destroy this parasite. Professor Bolley, of the North Dakota Experiment Station, says it is impossible to detect smut on seed grain with a magnifying glass because the smut is too small to be seen even by a very good microscope.

Poor seed is not accountable for smut. The lateness in ripening of smutty heads is no doubt due to the weakening effect of the presence of the smut plant sapping the life of the grain. Smut grains, or spores, as the correct scientific name is, falling on the ground in the fall will live over the winter, though the majority of them are killed, and will, if in contact with a grain of wheat, germinate in the spring and enter the wheat. But the greatest source of infection is from the smut on the seed grain itself. This is where the greatest danger lies. It is to kill these smut spores clinging to the wheat berry, and which are so small that the naked eye, aided by a good magnifying glass, cannot see them, that bluestone or formalin is used.

Bluestoning for Wheat.

Dissolve the bluestone in hot water, then add enough cold to make two or two and a half pails of liquid solution, out of one pound of bluestone. Careful sprinkling and turning will do, but the best plan is to take a tub, two feet deep, made

out of a coal oil barrel, in which to hold the liquid. Take an open-meshed sack and put in it a bushel or bushel and a half of wheat. Souse the bag in it for a minute, then set it out on a board whose end lies over the edge of the tub to drip the surplus water back into the tub, which it will do in a minute or two. While it is dripping dip in another sack. About a pound of bluestone to eight bushels of wheat is enough for all wheat not very smutty. If bad, make the solution a little stronger, say one pound to five bushels.

Formalin for Oat Smut.

At Farmers' Institute meetings S. A. Bedford has been recommending formalin as superior to bluestone for killing oat smut. Of this treatment he says:—"We use 4½ oz. formalin mixed with 10 gallons of cold water; the oats are allowed to steep in this liquid for five minutes, the surplus is then drained back into the barrel and the grain afterwards spread on the floor to dry. In the eastern provinces it is considered necessary to soak the oats in the above liquid for two hours, but equally good results were obtained on the Experimental Farm at Brandon from a ten minutes' steeping as from the longer period. With a fairly dry sample of oats the ten gallons of liquid should be sufficient for thirty bushels of seed."

Formalin is equally valuable for wheat, and is used in the same way, but dipping in the solution is all that it needs, as the smut is all on the outside of the berry, while it seems to work into the husk of the oat.

Cleaning Brome Grass Seed.

So many farmers are growing Brome grass in greater or less quantities that a knowledge of the best way of cleaning the seed is important. If the grass is cut with the binder the sheaf can be threshed by putting the heads only into the mill and drawing them out when threshed. The seed is so very light that great difficulty has been experienced in cleaning it. Consequently to prevent it being blown over in the chaff, the fan of the separator mill is run backwards and all the seed brought down over the sieves. The fanning mill is also turned backwards in cleaning the seed.

On many farms it is a most difficult thing to keep a monkey wrench at hand when wanted, or to prevent its being lost. S. A. Bedford has solved this problem very satisfactorily with his teamsters. To one of the backband straps of the team harness is fastened a good big snap and in this is snapped a nine-inch Acme wrench, i.e., one in which the handle is a rod twisted and with a loop at the end. It is always handy when the teamster wants it and never lost.

THE GARDEN.

Best Varieties of Fruits.

Below is a list of some of the hardiest sorts of fruits which have been found by practical experience to succeed in Manitoba :—

- Strawberries—Wilson, Crescent, Gandy.
- Red Currants—North Star, Stewart's Seedling, Raby Castle.
- White Currants—White Grape, White Dutch.
- Black Currants—Black Naples, Lee's Prolific.
- Gooseberries—Houghton's Seedling, Smith's Improved.
- Red Raspberries—Turner.
- Plums—Selected sorts of the native (no others are any good).
- Crab-apples—Transcendent, Hyslop.

Bees in Manitoba.

J. J. Gunn, Gonor, Man., a bee-keeper of fourteen years' experience in the west, urges the following reasons why farmers and others should keep bees :—

The great profusion and variety of our wild flowers, furnishing continuous pasture from April to the end of September.

It is a pleasant and profitable occupation, and much of the work can be done by the women, the boys or the girls.

As an auxiliary to fruit growing and gardening it is invaluable—on account of the fertilizing work of the insects among the blossoms.

Wintering, if adequate attention is given, is little, if any more difficult than in Ontario, and so far such evils as foul brood and moths have not been seen.

Flavor and aroma of most Manitoba honey is better than the best known in the markets.

Bee-keeping pays. In 14 years of the writer's experience there has occurred only one failure in the honey crop, which was more than balanced by other seasons when the honey crop went as high as 165 pounds of extracted honey per hive, spring count.

To Kill Currant Worms.

White hellebore is the best and simplest remedy for killing worms on the currant bushes. It is poisonous to the insects but not enough so to endanger a person's life. It can be applied dry by dusting it on the bushes when wet with dew. A little flour added will make it more adhesive. The usual method of applying it is in water, one ounce to three gallons. It soon loses its strength and fresh material should always be obtained.

Paris green can be used very successfully before the fruit is far advanced, but is always more dangerous than hellebore, though more effective in destroying worms. If the bushes are attacked by the currant span-worm — worms that loop when walking — paris green is the best to use, because hellebore does not seem to be strong enough for them.

Air-slacked lime, old and dry is best, mixed with a little sulphur and dusted on the leaves when damp will destroy them. See that the foliage is well covered with it, and there will soon be no worms. The best thing to dust the powder on with is a large pepper duster, or a baking powder can with a lot of fine holes punched in the bottom. What is equally as good is to put the mixture in a piece of coarse cloth and shake it vigorously over the leaves. If not washed off by rain, one application will clear off one hatching of worms. When another set hatches repeat the application.

Timber Regulations.

As the timber regulations are a matter of great importance to the farmers of Manitoba and the Territories, the following synopsis of them, as revised in 1900, will be of interest :—

"A homesteader may obtain a free permit to cut 3,000 lineal feet of building timber, no log to be over 12 inches at the butt end unless the timber is cut from dry trees, in which case timber of any diameter may be taken. He is also allowed free of dues, 400 roof poles, 500 fence posts and 2,000 fence rails.

"Settlers who have not received homestead entry are not entitled to a free permit for the above quantity of timber, except they have purchased land from the Canadian Pacific Railway Company.

"Homesteaders and all bona fide settlers may obtain free permits to take and cut dry timber for their own use on their farms for fuel and fencing."

In order to encourage the establishing of small mills in outlying districts, so as to supply cheap lumber to incoming settlers, the dues payable to the Government on square timber and saw-logs of any kind of wood except oak have been reduced to \$1.50 per thousand feet, board measurement. The dues on oak are \$3 per thousand.

How New Insects Reach Us.

Agriculturists are beginning to realize that their crop interests are quite as seriously threatened by foreign insect pests as by native ones. The list of imported insects is already a long one, and in it we find the Hessian fly, the common cabbage worm, most of the dangerous scale insects, and most of the granary, household and greenhouse pests.

The general trend of insect migration, as well as weed migration, is, and has always been, from the east to west, and with increasing trade relations with western nations, injurious insects are liable to be introduced also from the west.

Insect immigrants come in many ways—either as unnoticed passengers in crevices in vessels, or in their natural food, such as nursery stock, fruits, clothes, lumber or domestic animals. Of this class are scale insects, eggs of plant-lice, and the eggs and larvae of many other insects. Or insects may come in packing substances used to surround merchandise, such as straw or grass. All of the grass-stem maggots common to Europe and North America have probably reached us by this method, including the Hessian fly, the wheat-midge, and wheat-stem saw-fly.—P. B. Gregson, Waghorn, Alta., Secretary of Northwest Entomological Society.

Specimens of insects sent to the Entomologist, Central Experimental Farm, Ottawa, are identified free.

To Kill Caterpillars on Trees.

Close watch should be kept upon the trees, and at the first sign of a caterpillar the fight should begin. If the caterpillars gather in "tents" at night the clusters can be burned or wiped out by using a rag or sponge saturated with coal oil. This kind feed during the day, scattering in all directions in bright weather, but gathering together in bunches at night. Burn or wipe them out.

If the caterpillars do not gather together so that they can be handled in this way, then the leaves (their food) should be covered with something that will poison them. Spraying with the Bordeaux mixture has been found effectual, especially when Paris green has been added to it. But a thorough dressing with the old-time remedy, four ounces of Paris green and four ounces fresh lime, to 50 gallons of water, is, in many cases, very effectual, but as the Paris green does not dissolve, the water has to be constantly stirred. A more effectual spray is made as follows:—Dissolve 11 ounces of acetate of lead (sugar of lead) in four quarts of water in a wooden pail, and four ounces of arsenate of soda (50 per cent. purity), in two quarts of water in

another wooden pail. As sugar of lead dissolves rather slowly in cold water the process can be hastened by using warm water. Pour the solutions into from 100 to 150 gallons of water and the insecticide is ready for use. To spread any of these solutions over the leaves, a good spray pump is needed, but such a pump will prove a profitable investment if the trees are saved.

Poison for Cut Worms In Garden and Field.

Cut worms sometimes do great damage in gardens and grain crops during the months of May and early June. They work at night and cut off plants just at or below the surface of the ground. These worms pass the winter generally in a half grown state and in the spring are ready to attack any green thing.

In the garden they are fond of young carrots and onions, etc., but may be poisoned by dipping succulent vegetation— weeds, grass, anything will do if green and succulent— into a strong mixture of Paris green, an ounce or two to a pail of water. Now spread bunches of this around the garden a few feet apart. The hungry worms find these poisoned baits at night and feast on them. It has been found that they are very fond of a mixture of bran and shorts mixed with Paris green and sweetened water until about the consistency of porridge. If this is spread in little heaps, about a teaspoonful at a place, along the rows of young plants it is desired to protect, the worms will generally eat it in preference to the plants, and after trying this they will never try the plants again. One pound of Paris green to 50 pounds of bran and shorts is about the right proportion.

In the fields the worms generally prefer such juicy plants as lamb's quarter, but sometimes destroy whole fields of grain. The most satisfactory remedy or method of destroying them when present in such large numbers is to thoroughly spray with Paris green a strip of grain 10 feet wide in front of where they are working. The plan of using poisoned bran, etc., as given above, is too slow and expensive for field methods.

Coal Oil Emulsion.

Following is the formula recommended by Professor Jas. Fletcher, Dominion Botanist and Entomologist, for the treatment of a number of the insect enemies which attack trees and bushes:—Coal oil, 2 gals.; rain water, 1 gal.; soap, half-pound. Dissolve soap in water by boiling; take from fire and, while hot, turn in the coal oil and churn briskly for five minutes. To be diluted before using with nine parts of water.

MISCELLANEOUS.

Game Laws of Manitoba and N.W.T.

According to the statute as standing in 1900 the periods during which game may be shot are fixed by law as follows:

MANITOBA.

Deer—15th September to 1st December.

Ducks—1st September to 1st January.

Prairie chickens and other grouse—1st October to 15th November.

Pheasants and partridges—1st October to 15th November.

Plover, quail, woodcock, snipe and sandpiper—1st August to 1st January.

No female deer, elk, moose, etc., or the fawns of such animals may be shot at any time and no person shall kill more than two of the males of such animals in any season.

Not more than 100 prairie chicken or other grouse, pheasants or partridges shall be shot in one season by any person, nor more than 20 of such birds in one day.

None of the above mentioned animals or birds may be shot or killed between one hour after sunset and one hour before sunrise, nor on any Sunday.

Non-residents must procure a permit to shoot from the Department of Agriculture and Immigration.

No person shall have in his possession any of the foregoing animals and birds during the close season except for the private use of himself and family for food, or for domestication. Prairie chicken, grouse, pheasant and partridges may be kept for food 45 days only after the close of the season.

Any of the above mentioned animals or birds may be kept for domestication, for which purpose a permit must be secured from the Minister of Agriculture and Immigration.

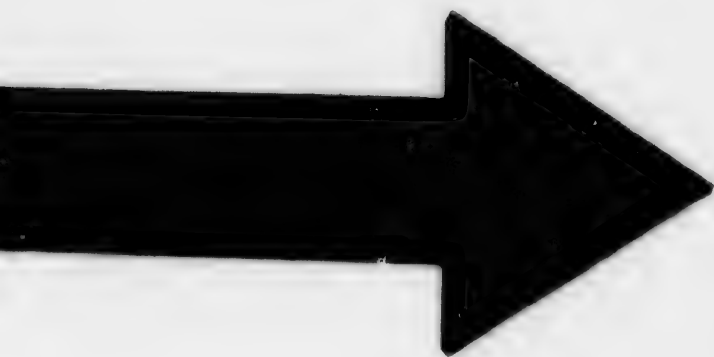
NORTHWEST TERRITORIES.

Deer—October 1st to February 1st.

Prairie chickens and other grouse—September 15th to December 15th.

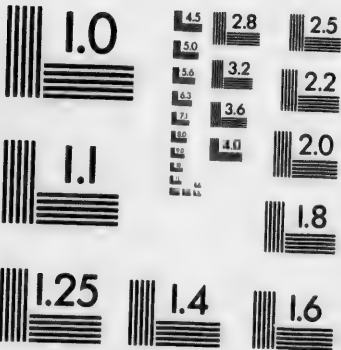
Wild ducks, snipes and sandpipers—August 23rd to December 30th.





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Things Worth Knowing.

Mink, fisher or marten—November 1st to April 15th.

Muskrat—November 1st to May 15th.

Otter or beaver—October 1st to May 15th, except Eastern Assiniboia, where no beaver may be hunted, trapped or killed at any time until November 1st, 1901.

Killing or taking of buffalo is punishable with a fine not exceeding \$100; and any other violation, with a fine not exceeding \$50, with costs of prosecution.

No person shall be allowed to kill or take more than six head of elk, moose, cariboo, antelope, deer or their fawn, mountain sheep or goat, in any one season, except for the purposes of food for himself or his family. In that part of Assiniboia south of Township 23 and east of Range 24 west of 2nd Meridian, none of the animals mentioned in this section may be hunted, taken or killed until October, 1901.

No person shall kill more than 20 grouse, partridges, pheasant or prairie chicken in one day.

No person shall at any time disturb, injure, gather or take the eggs of any species of wild fowl or birds mentioned.

No person or corporation shall at any time or in any manner export or cause to be exported or carried out of the limits of the Northwest Territories any grouse, partridge, pheasant, prairie chicken, elk, moose, cariboo, antelope or their fawn.

Notwithstanding anything hereinbefore contained, any traveller, family or other person in a state of actual want may kill any bird or animal herein mentioned, and take any egg or eggs hereinbefore referred to, for the purpose of satisfying his immediate want, but not otherwise.

No person who is not a resident of the Territories, shall hunt, take or kill any of the aforesaid animals or birds unless he has obtained from the Commissioner of Agriculture a license on payment of \$15. Such license is only valid between August 1st and December 31st in the year of issue and only confers rights on non-residents to shoot animals and birds after expiration of two weeks from the first day on which any protected animal or bird may be lawfully hunted by residents of the Territories until the commencement of the close season next following.

The Rule of the Road.

Every year it becomes of greater importance that every one using the road for driving and bicycling should be guided by a fixed general rule and be familiar with every point of the law bearing on the matter. It is because of ignorance or neglect of this that a good many preventible accidents take place. It is important, therefore, that every one should know the change made during the 1900 session of the Mani-

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toba Parliament, by which the provisions of Sec. 32 of 61 Victoria are repealed and the following put in its place :—

In case of a person travelling or being upon a highway in charge of a vehicle drawn by one or more horses, one or more animals, meets another vehicle drawn as aforesaid, he shall turn out to the right from the centre of the road, allowing to the vehicle so met one-half of the road.

In case a person travelling or being upon a highway in charge of a vehicle as aforesaid, meets a person travelling upon a bicycle or tricycle, he shall, where practicable, turn to the right from the centre of the road to allow the person travelling upon the bicycle or tricycle sufficient room on the travelled portion of the highway to pass.

In case a person travelling or being upon a highway in charge of a vehicle as aforesaid, or on horseback, is overtaken by any vehicle or horseman travelling at a greater speed, the person so overtaken shall quietly turn out to the right and allow the said vehicle or horseman to pass.

Any person so overtaking another vehicle or horseman shall turn out to the left so far as may be necessary to avoid a collision with the vehicle or horseman so overtaken, and the person so overtaken shall not be required to leave more than one-half of the road free.

In case a person travelling or being upon a street or highway upon a bicycle or tricycle is overtaken by any vehicle as aforesaid, or horseman travelling at a greater speed, the person so overtaken shall quietly turn out to the right and allow the said vehicle or horseman to pass, and the person so overtaking the bicycle or tricycle shall turn out to the left so far as may be necessary to avoid a collision.

In case a person travelling upon a highway on a bicycle or a tricycle overtakes any vehicle as aforesaid or horseman travelling at a less speed, or a person travelling on foot, the person travelling on the bicycle or the tricycle shall give the other person audible warning of his approach before attempting to pass and shall pass to the left of such vehicle or horseman, who, if practicable, shall turn to the right to allow such bicycle or tricycle sufficient room to pass on the travelled roadway.

In case two persons travelling upon bicycles or tricycles meet each shall turn to the right.

In case a person travelling on a bicycle overtakes another travelling upon a bicycle the one overtaken shall keep or turn to the right of the travelled way to allow the other to pass on the left.

Persons travelling upon bicycles shall keep to the right of the middle line of the travelled roadway.

Persons travelling upon bicycles and turning at street intersections from one street to another shall if turning to the right keep close to the corner of the street intersection; if turning to the left they shall first cross the intersecting street and then turn so as to keep to the right of the roadway.

A Legal Fence in the Territories.

Any substantial fence not less than four feet high is legal in the N. W. T., if it consists:—

- (a) Of rails or boards not less than four in number, the lower one not more than eighteen inches from the ground and each panel not exceeding twelve feet in length;
- (b) Of upright posts, boards or palings not more than six inches apart;
- (c) Of barbed wire and a substantial top-rail, the wires to be not less than two in number and the lower one not more than twenty inches from the ground, posts to be not more than sixteen and a half feet apart;
- (d) Of three or more barbed wires, the lower one not more than twenty inches from the ground, posts to be not more than sixteen and a half feet apart;
- (e) Of not less than three barbed wires on posts not more than fifty feet apart, the wires being fastened to droppers not less than two inches in width and one inch in thickness or willow or other poles not less than one inch in diameter at the small end of wire dropper, the said droppers or poles being placed at regular intervals of not more than seven feet apart;
- (f) Of two posts spiked together at the top and resting on the ground in the shape of an A, which shall be joined by a brace firmly nailed near the base, with three rails firmly secured on the one side of the A, the top rail not less than four feet and the bottom rail not less than eighteen inches from the ground, there being also firmly secured on the other side of the A one rail not more than twenty inches from the ground;
- (g) Of woven wire secured to posts not more than thirty-five feet apart;
- (h) Any river bank or other natural boundary sufficient to keep domestic animals out of any land;
- (i) Any fence surrounding stacks of hay or grain shall be deemed a lawful fence if constructed according to the above provisions and situated not less than ten feet from such stacks.

It shall be the duty of any person erecting any wire fence across any trail that has been in common use by the public for a period of three months immediately previous to such erection to place a top rail on such fence where it crosses the trail and for a distance of two rods on each side from the centre of the trail.

It has been calculated that it takes nearly six miles of walking to turn an acre of land with a 16-inch plow, and to plow 2½ acres in a day means a walk of 15 miles, at a speed of less than two miles an hour.

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Home Cured Meats.

Farmers should always know how to kill and cure their own pork. There is always a good demand for home-cured meats, and with a little pains every farmer can have nice sweet meats, and many buyers prefer the home-cured to those from the packing houses.

DRY SALTING.

Dry salting is a very satisfactory way, and some think more rapid than brine salting. We give two plans:—

1. Most delicious hams, shoulders, bacon and dried beef are cured by the dry process or without brine. Take one part brown sugar to ten parts salt, and one ounce of saltpetre to each 100 pounds of meat. Pulverize the last finely and mix all together thoroughly. Lay the meat on a bench or table in a place where it will not freeze, but will be cool. Rub the preparation all over each piece and pile the pieces together, but not over four high. In a week repeat the process, but when the pieces are piled up this time reverse their position, and the sides that were uppermost the first time should now be turned down. In another week make the third application, and in a week or ten days more the pieces are ready for the smoke house. Beef should be smoked a little only, or much less than pork. Such meat is sweet, juicy and will tickle any palate.

2. The famous Virginia Smithfield hams are cured by the following process:—

The hams are placed in a large tray of fine salt, then the flesh surface is sprinkled with finely ground, crude saltpetre until the hams are as white as though covered by a moderate frost—or say use three or four pounds of saltpetre to the thousand pounds of green hams. After applying the saltpetre immediately salt with the fine salt, covering well the entire surface. Now pack the hams in the bulk, but not in piles more than three feet high. In ordinary weather the hams should remain thus for three days. Then break bulk and re-salt with fine salt. The hams thus salted and re-salted should now remain in salt in bulk one day for each and every pound each ham weighs—that is, a 10-pound ham should remain in ten days, and in such proportion of time for larger and smaller sizes.

Next wash with tepid water until the hams are thoroughly cleaned, and after partially drying, rub the entire surface with finely-ground black pepper.

For small lots use to 100 pounds meat six pounds fine salt, two pounds brown sugar, four ounces fine saltpetre and four ounces black pepper. Mix thoroughly and rub in well all over the meat, and especially around the bones. Repeat this twice at intervals of several days or a week, when the meat will be found to be well salted. Be sure the salt is dry and hot when it is applied for the meat will take it better than if it is damp.

BRINE SALTING

Many good farmers prefer brine to dry salting. The following are well-tried recipes for making the brine. A good tub or barrel is necessary for this, and it must be sweet.

1. After the meat has been cooled for twenty-four to forty-eight hours, but not allowed to freeze, and the hams and shoulders trimmed, it is packed tightly in a barrel and covered with a brine made as follows :—

To every 100 pounds of meat 7 pounds fine salt, 5 pounds sugar, $1\frac{1}{2}$ ounces of saltpetre and 4 gallons of water. Mix and boil, unless pure, fresh rain water is used, and skim until all dirt or scum is removed. When cooled pour brine over the meat and put on a weight to keep it immersed. Should any taint or scum be noticed on the brine after a few days the meat must be removed and thoroughly washed in clear water, the brine boiled and the barrel scalded or a new one procured. After ten days or two weeks the meat should be removed and repacked, so that all parts of it may become salted. If a piece of steel or a long knife is run in along the bone in the hams and shoulders it will insure uniform salting. For light hams and bacon four weeks of salting is none too long, and for heavy hams and meat that is wanted for keeping through the summer, six to eight weeks is required. After the meat has been salted sufficiently, remove from the brine and hang up to dry before starting the smoke. The meat should be lightly sprinkled with black pepper after thoroughly draining.

2. A prize South Carolina recipe is as follows :—

To 100 pounds of meat, use four quarts salt, four pounds brown sugar and three ounces saltpetre. The ingredients should be well mixed, the salt having been beaten fine. When the meat is cold, rub in two-thirds of the mixture and pack meat in a cask. The next day rub in the remaining third, and put meat again in cask, reversing the pieces from top to bottom. Let them remain three weeks, reversing pieces once a week. At the end of two weeks pour off liquor in the cask, boil and skim till clear, and when cool pour over the meat again. At the end of three weeks wash meat in hot water, wipe dry and smoke three weeks, after which bag and hang up.

3. For 100 pounds of beef or pork, use eight pounds of salt, five of sugar (or five pints of New Orleans molasses), two ounces of soda, one ounce of saltpetre, four gallons of soft water, or enough to cover the meat. Mix part of the sugar and salt dry and rub each piece of meat with the mixture. Sprinkle the bottom of the barrel or tub with salt, and pack the meat as closely as possible. After packing the meat, put the remaining salt and sugar into the water. Dissolve the soda and saltpetre in hot water, and add to the brine. When salt and sugar are dissolved, pour the brine over the meat. Cover with a board and weight this down so that the meat will be held in place, and be entirely submerged in the brine. If there is not enough brine, more must be prepared. Do not use the brine warm.

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Don't forget that thin pieces and light hams and shoulders will cure much quicker than the heavy ones and should be taken out of the brine before the heavy ones. The same applies to smoking. Some farmers let the pork lie in brine until spring.

SMOKING MEATS.

The thin pieces, shoulders and hams are much improved by smoking. The smoke house should be tight; the tighter it is the more quickly will the work be done. If you haven't a smoke house, use a large packing case. Good hardwood, cut in small pieces, makes the best fire. Start a fire with shavings and add fine wood. It is well to do this in an old milk pan or similar vessel; then, when going nicely, cover with another old one, leaving just enough space for air to get in to keep it going. This will partially smother the fire, making a lot of smoke without much heat. Meat should be hung so that the heat will not affect it. A light, uniform smoke will soon give the light, glossy brown color so much desired. A dark brown is not the best. The time required will be from four days to a month, depending upon the steadiness with which the smoke is kept up, the quantity of meat and the tightness of the house. When smoked, the meat should be hung in a dry place. Before doing so, it is well to wrap each one carefully in good strong paper. Several wrappings are better. Some then whitewash the outside, others pack them away in a barrel or bin of dry oats. The idea is to get a dry place.

Salting Beef.

We know of nothing better than brine salting. When cool, cut up the meat and pack in a tight tub or barrel; now cover with brine, made as follows: To one pail of water add a dipperful of salt, $\frac{1}{2}$ oz. saltpetre, and $\frac{1}{2}$ lb. of granulated sugar. This will cover 40 to 50 lbs. of meat. The salt may be dissolved in warm water, but must be used cold. Place a weight on top to keep the meat under the brine. If the brine becomes bloody-looking, change it. This may show in from one to three weeks after first putting in. If so, fresh brine should be used and the first put away. Keep the meat always under brine, and if there is any indication of the brine souring, take out the meat, wash in fresh water and pack again in new brine. Should it get too salty, say along in March, the brine may be taken off and the meat kept in an air-tight barrel. Keep always in a cool place and the meat will keep all summer.

A plant evaporates from 200 to 250 lbs. of water from the soil for every pound of dry matter produced, and yet farmers allow weeds to grow on the summer-fallow and elsewhere to exhaust the supply of moisture just as though there was no limit to it.

Salting Hides.

An Australian exchange thus describes a method of curing hides thought very suitable for that country:—

Avoid cutting the hides, and do not leave flesh on; this affects the sale to a greater extent than is generally supposed. When trimming, cut off the knee and the hind shanks from the hocks, also the head, ears, and face pieces, leaving the cheeks only. Lay the hides flat, one on top of the other, butt to butt, on a clean floor with a little slope, to allow the brine to drain out.

Salting—As laid down they should receive from ten to twelve pounds of salt, and be left in salt fully eight days before being taken up; when taken up, shake out the surplus salt and sweep the hides before rolling up for market. The salting varies according to size and thickness of the hide, and should be spread evenly over, butt part receiving the most. A great loss is often occasioned by the want of a few extra pounds of salt (a trifling cost in itself), for the hides become slippery or loose-haired, causing them to be sold as faulty, and incurring a loss of 4d. to 1d. per lb. in price. Cleanliness is the only thing required to give the hides the kind of flesh desirable.

Folding—When folding, the flesh side to be inside; throw the head towards the tail, the fold starting from the wither, the sides to be thrown in, meeting at the centre of the hide, and then rolled tightly from the head and securely tied with two pieces of strong lashing at each end, attaching to same a piece of leather or tin with owner's initials marked on in ink, and an address label.

Poisonous Atmosphere In Wells.

Every now and then accounts are published of persons descending into wells containing foul air, and becoming suffocated in consequence. The reason is because of the presence of carbonic acid gas, which is considerably heavier than common air, and which, when contained in large proportions in the atmosphere, is fatal to all animal life. The only safe course with old wells is to lower a light into the bottom. If that burns clear the well is safe. If it goes out, a bucket should be lowered to the bottom, in a minute or two drawn up and carefully turned bottom up some distance away. The apparently empty bucket gets filled with the foul air, which can in this way be drawn up and replaced with pure air that contains the proper quantity of oxygen. A light lowered after a few repetitions of this process will directly show that it has been effective if carefully done. From ignorance or carelessness in regard to this simple principle, several lives have been sacrificed in Manitoba and the N.W.T., and will be again so long as nature's laws remain what they are, if we are careless about what they teach us.

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Drive Wells.

The following pointers by H. Cater, Brandon (practical pump-dealer), as to the making of drive wells, will be of interest to many farmers in this country :—

1. The piping can only be driven 25 feet at most, as the cylinder must be within that distance of the end of the drive point, in order to lift water. Any greater distance must be made up by digging the necessary additional distance from the top and cribbing in the usual manner, so as to let the cylinder down low enough.

2. Put the drive point on a length of ordinary gas pipe, the same size as the point, then take a block of hard wood and a sledge hammer and drive it down, keep on adding pipe till you have the point down as far as you want it to get a supply of water. The top end of the pipe should then be about two feet above the bottom of the hole. Then put on the cylinder and pipe and rod to reach the surface of the ground. Then put on the pump head in the ordinary way.

3. Drive wells are not satisfactory unless you have a loose coarse gravel subsoil, and are sure of a good supply of water at not more than 20 or 25 feet. If it is fine sand it will not work, as the sand will suck up into the drive point and choke it up in a short time, and if the soil where you want to drive the point is firm, it will be impossible to drive it. It is very important to know how far the water is from the surface, so as to make sure when the pipe is driven far enough.

Where Pure Water Cannot be Obtained.

In some parts of this country water of a pure nature is very difficult, or impossible, to obtain. In some cases which have come under our notice the water is charged with sulphate of magnesia (Epsom salts), sulphate of lime (gypsum) and other minerals. Of such water Frank T. Shutt, Chemist, Central Experimental Farm, says:—"The continued and constant use of such water cannot be recommended, though I am willing to admit many individuals (and animals) can be habituated to it, and apparently suffer no injury to health. However, if this is the best water you can get, I should advise you to obtain a small household still, which will furnish you water for drinking purposes free from all saline matter. They are practically automatic, cheap and easy of management."

It is worth while noting that in such cases samples of water sent from any part of Canada to the address of the Chemist, Central Experimental Farm, Ottawa, will be analyzed and reported upon, opinion also being given as to their healthfulness.

Promissory Notes.

A promissory note is an unconditional written promise to pay to a specified person a specified sum at a specified time, all of which must be written on the note itself. If there are conditions attached, it is not a note pure and simple, but a contract.

A note given on Sunday is void, and notes due on Sunday or a legal holiday become due and payable on the following day. When a note is made payable at a definite date three days of grace are allowed beyond that time to make payment. Notes payable on demand are not entitled to grace.

Notes payable on demand or on sight draw no interest, until after demand or presentation, unless on their face it is provided that they shall pay interest. If a note is to draw interest higher than legal interest it must be so specified. If "with interest," and no rate is specified, it draws the legal rate, which has recently been reduced from six to five per cent. per annum.

If a note has been lost, mislaid, or destroyed, it does not release the maker from obligation, but the holder must make the formal demand, offering the maker a sufficient indemnity in the event of his paying the same.

Poisons.

There is no more dread word in the language than this little six-letter one—Poison. Few of us, however, recognize the danger really existing to thousands of men, women and children from a careless use and storage of things poisonous.

In many families bottles are allowed to accumulate without labels, and poisonous medicines are permitted to mingle on the same shelf with harmless and often-resorted-to drugs and remedies. Everything of a poisonous nature should be most carefully and plainly marked in the first place, and then kept in such a locality as to be difficult of access, to say the least.

POISONS AND THEIR ANTIDOTES.

Aconite Tincture.—Antidote: Emetics, stimulants (internal and external).

Arsenic (Arsenious Acid).—Antidote: Limewater in copious draughts, emetic of mustard, flaxseed tea.

Atropia.—Antidote: Emetic of mustard.

Chloral Hydrate.—Antidote: Stomach-pump or emetic of mustard, cold effusion of head or spine, artificial respiration.

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Chloroform.—Antidote : Fresh, pure air and artificial respiration.

Corrosive Sublimate.—Antidote : Emetic of mustard or other safe emetic ; if vomiting does not already exist. Both yolk and white of egg mixed in water, administered in large quantities. Wheaten flour and milk.

Cotton Root.—Antidote : Emetic of mustard or other safe emetic.

Cyanide of Potassium.—Antidote : Fresh air, artificial respiration, cold effusion.

Digitalis Tincture.—Antidote : Take often strong coffee or tea without milk or sugar ; lie flat ; produce vomiting by a teaspoonful of mustard in warm water.

Donovan's Solution (a solution of arsenic and mercury).—Antidote : Limewater in copious draughts ; emetic of mustard or flaxseed tea.

Laudanum (ticture of opium).—Antidote : Strong emetic of mustard or other safe emetic, with stomach-pump ; dash cold water on the face ; keep awake and in motion ; strong coffee and artificial respiration.

Morphine (morphia).—Antidote : Strong emetic of mustard or other safe emetic, with stomach-pump ; dash cold water on the face ; keep awake and in motion ; strong coffee and artificial respiration.

Nux Vomica Tincture.—Antidote : Emetic of mustard ; relieve spasms with chloroform or ether.

Oil of Pennyroyal.—Antidote : Emetic of mustard or other safe emetic.

Opium.—Antidote : Strong emetic of mustard or other safe emetic, with stomach-pump ; dash cold water in the face ; keep awake and in motion ; strong coffee and artificial respiration.

Paris Green (an arsenical preparation).—Antidote : Limewater in copious draughts, emetic of mustard or flaxseed tea.

Phosphorus.—Antidote : Emetic of mustard or other safe emetic.

Strychnia.—Antidote : Emetic of mustard or other safe emetic ; relieve spasms with chloroform, ether, or opium.

Veratrum Viride Tincture.—Antidote : Emetic of mustard or other safe emetic.

The British Government is the owner of 25,000 camels.

In 1896 Canada's cattle trade with the United States amounted to only 1,645 head, valued at \$8,870, or about \$5 per head. For the year ending June 30, 1900, the exports amounted to 90,409 head, valued at \$1,273,000, or a little over \$14 per head.

Various Measures.

A hand, in horse measure, is 4 inches.
 A palm is 3 inches, and a span is 9 inches.
 There are 320 poles or 1,760 yards in a mile.
 The fathom, 6 feet, is derived from the full grown length of a man.
 An Irish mile is 2,240 yards.
 A Scotch mile is 1,984 yards, or 80 are equal to 91 English.
 A nautical mile is 2,026.5 yards.

LAND MEASUREMENTS.

7.92 inches constitute 1 link; 100 links 1 chain, 4 rods or poles, or 66 feet, and 80 chains 1 mile. A square chain is 16 square poles, and 10 square chains are 1 acre. Four rods are an acre, each containing 1,210 square rods, or 34,785 yards, or 94 yards 28 inches each side.

Forty poles of 30.25 square yards each is a rood, and a pole is $1\frac{1}{4}$ yards each way.

An acre is 4,840 square yards, or 69 yards 1 foot $8\frac{1}{2}$ inches each way; and 2 acres, or 9,680 square yards are 98 yards 1 foot 2 inches each way; and 3 acres are 120 $\frac{1}{2}$ yards each way. A square mile, or a section of land is 640 acres, being 1,760 yards each way; half a mile, or 880 yards each way, is 160 acres; a quarter of a mile, or 440 yards each way, is a park or farm of 40 acres; and a furlong, or 220 yards each way, is 10 acres.

Any length or breadth in yards which multiplied make 4,840 is an acre; any which makes 12.10 is a rood, and 30.25 is a pole.

An English acre is a square nearly 70 yards each way; a Scotch of 77 $\frac{1}{2}$ yards, and an Irish of 88 $\frac{1}{2}$ yards.

BOX MEASURES.

Farmers and market gardeners will find a series of box measures very useful, and they can be readily made by any one who understands the two-foot rule, and can handle the saw and the hammer. A box sixteen by sixteen and one-eighth inches square and eight inches deep, will contain a bushel or 2150.4 cubic inches, each inch in depth holding one gallon.

A box twenty-four by eleven and one-fifth inches square and eight inches deep will also contain a bushel, or 2150.4 cubic inches, each inch in depth holding one gallon.

A box twelve by eleven and one-fifth inches square and eight inches deep will contain half a bushel, or 1075.2 inches, each inch in depth holding half a gallon.

A box eight by eight and one-fourth inches square and eight inches deep will contain half a peck, or 298.8 cubic inches. The gallon dry measure.

A box four by four inches square and four and one-fifth inches deep will contain one quart, or 67.2 cubic inches.

To find the number of shingles required in a roof—

Rule.—Multiply the number of sq. ft. by 8, if the shingles are exposed 4 $\frac{1}{2}$ in.; or by 7 1-5 if exposed 5 in. To find the

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number of sq. ft., multiply the length of the roof by twice the length of the rafters. To find the length of the rafters at one-fourth pitch, multiply the width of the building by .56 (hundredths); at one-third pitch, multiply it by .6 (tenths); at two-fifths pitch, by .64 (hundredths.) This gives the length of the rafters from the apex to the end of the wall, and whatever projects must be taken into consideration. Note.—By $\frac{1}{4}$ or 1-3 pitch is meant that the apex or comb of the roof is to be $\frac{1}{4}$ or 1-3 the width of the building *higher* than the walls at the base of the rafters.

CAPACITY OF CISTERNS.

In calculating the capacity of cisterns, $31\frac{1}{2}$ gallons are estimated to one barrel, and 63 gallons to one hoghead.

Circular Cistern one foot in depth.

Five feet in diameter holds	4 $\frac{1}{2}$ barrels
Six feet in diameter holds	6 $\frac{1}{2}$ barrels
Seven feet in diameter holds	9 barrels
Eight feet in diameter holds	12 barrels
Nine feet in diameter holds	15 barrels
Ten feet in diameter holds	18 $\frac{1}{2}$ barrels

Square Cistern one foot in depth.

Five feet by five feet holds	6 barrels
Six feet by six feet holds	8 $\frac{1}{2}$ barrels
Seven feet by seven feet holds	11 $\frac{1}{2}$ barrels
Eight feet by eight feet holds	15 $\frac{1}{2}$ barrels
Nine feet by nine feet holds	23 $\frac{1}{2}$ barrels
Ten feet by ten feet holds	29 $\frac{1}{2}$ barrels

Example.—A circular cistern 5 feet in diameter will contain 4 $\frac{1}{2}$ barrels for each foot in depth; if 10 feet deep, it contains (4 $\frac{1}{2}$ ×10), equal 45 barrels.

Weights and Measures for Cooks, Etc.

1 pound of wheat flour is equal to	1 quart
1 pound and 2 ounces of Indian meal make	1 quart
1 pound of soft butter is equal to	1 quart
1 pound and 2 ounces of best brown sugar make	1 quart
1 pound and 1 ounce of powdered white sugar make	1 quart
1 pound of broken loaf sugar is equal to	1 quart
4 large tablespoonfuls make	$\frac{1}{2}$ gill
8 large tablespoonfuls make	1 gill
16 large tablespoonfuls make	$\frac{1}{2}$ pint
1 Common-sized tumbler holds	$\frac{1}{2}$ pint
1 Common-sized wineglass is equal to	$\frac{1}{2}$ gill
1 teacup holds 4 fluid ounces or	1 gill
1 Teaspoon contains	1 drachm
1 Large Wineglass holds	2 ozs.
1 Tablespoonful is equal to	$\frac{1}{2}$ oz.
60 drops of water make a teaspoonful.	

Weight of a Cubic Foot of Earth, Stone, Metal, Etc.

Article.	Lbs.	Article.	Lbs.
Clay	120	Pine, white	34
Earth, loose.	94	Pine, yellow	34
Mud	102	Spruce	31
Sand, wet, about	128	Willow	36
Stone, common, about.	158	Blood.	66
Marble	165	Beer.	65
Mortar	110	Milk	64
Brick.	102	Oil, Linseed.	59
Water, rain.	62	Tar	64
Water, salt	64	Vinegar	67
Ash Wood	53	Honey	90
Cedar.	35	Cider	64
Chestnut	38	Gold.	1,203 $\frac{7}{8}$
Cork	15	Silver.	625 $\frac{1}{4}$
Ebony	83	Lead, cast	709
Hickory, shell-bark	43	Platina	1,219
Lignum Vitae Wood	83	Steel Plates.	487 $\frac{1}{4}$
Mahogany	66	Iron, cast.	450
Maple	47	Iron, wrought	486
Oak, Canadian	54	Zinc, cast.	428
Oak, live, seasoned	67	Glass Window	165
Oak, white, dry	54	Copper, cast.	547
Pine, red	37	Coal, Lehigh	56
Pine, well seasoned	30	Ice.	57 $\frac{1}{2}$

Building Pointers.

1,000 shingles, laid 4 inches to the weather, will cover 100 square feet of surface, and 5 lbs. of shingle nails will fasten them on.

One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and matching.

1,000 laths will cover 70 yards of surface, and 11 lbs. of lath nails will nail them on. Eight bushels of good lime, 16 bushels of sand, and 1 bushel of hair, will make enough good mortar to plaster 100 square yards.

A cord of stone, three bushels of lime, and a cubic yard of sand, will lay 100 cubic feet of wall.

Five courses of brick will lay 1 foot in height on a chimney, 6 bricks in a course will make a flue 4 inches wide and 12 inches long, and 8 bricks in a course will make a flue 8 inches wide and 16 inches long.

Cement 1 bushel and sand 2 bushels will cover 3 $\frac{1}{2}$ square yards 1 inch thick, 4 $\frac{1}{2}$ square yards $\frac{3}{4}$ -inch thick, and 6 $\frac{1}{2}$ square yards $\frac{1}{2}$ -inch thick. One bushel cement and 1 of sand will cover 2 $\frac{1}{2}$ square yards 1 inch thick, 3 square yards $\frac{3}{4}$ -inch thick, and 4 $\frac{1}{2}$ square yards $\frac{1}{2}$ -inch thick.

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The Farmer's Library.

THE BEST BOOKS FOR FARMERS.

LATEST AND MOST SATISFACTORY WORKS ON
RURAL TOPICS.

Every farmer should have a library of works bearing upon his business. The following is a list of the best books upon the various phases of farm work. A selection from this list of books most suited to his needs will give any farmer the nucleus of a useful library, to which he can add other books from time to time.

GENERAL AGRICULTURE.

Agriculture	By C. C. James	30
Agriculture	By Mills & Shaw	40
The Soil	By F. H. King	1 25
The Chemistry of the Farm.....	By W. Warrington	1 00
The Fertility of the Land	By I. P. Roberts	1 25
Land Drainage	By Manly Miles	1 00
First Principles of Agriculture...	By E. B. Voorhees	1 00
Agriculture	By F. H. Storer, 1,875 pages, 3 vols.	5 00
Barn Building	By Saunders	2 00
Irrigation and Drainage	By F. H. King	1 50
A Book on Silage	By F. W. Woll	1 00
Soiling, Ensilage & Barn Construction,	by F. S. Peer	1 00
Forage Crops	By Thos. Shaw	1 00
The Farmstead	By I. P. Roberts	1 25
The Modern Farmer	By E. F. Adams	2 00
Farmyard Manure	By Aikman	50

LIVE STOCK.

Feeds and Feeding	By W. A. Henry	\$2 00
Feeding Animals	By E. W. Stewart	1 50
Theory and Practice of Cattle Breeding.....	By William Warfield	2 00
Cattle Breeding	By Manly Miles	1 50
Horse Breeding	By J. H. Sanders	1 50
Swine Husbandry	By F. D. Coburn	1 75
The Practical Shepherd	By H. Stewart	1 50
The Study of Breeds (Cattle, Sheep and Swine).....	By Thos. Shaw	1 50
Light Horses—Breeds and Management	} Vinton Series. {	1 00 each
Heavy Horses—Breeds and Management		
Sheep—Breeds and Management		
Cattle—Breeds and Management		
Pigs—Breeds and Management, by Sanders	Spencer	1 00
The Domestic Sheep	By H. Stewart	1 50
The Sheep	By Wm. A. Rushworth	1 50

Things Worth Knowing.

The Farmer's Veterinary Adviser.....	By Jas. Law	3 00
Home Pork-Making	By A. W. Fulton	50
Successful Farming	By Wm. Rennie, Sr.	1 50

DAIRYING.

American Dairying	By H. B. Gurler	1 00
Dairy Bacteriology	By H. L. Russell	1 00
Milk and Its Products.....	By H. H. Wing	1 00
Testing Milk and its Products, by Farrington & Woll		1 00
The Chemistry of Dairying.....	By H. Snyder	1 50

POULTRY.

Artificial Incubating and Brooding.....	By Cyphers	50
Practical Poultry Keeper.....	By L. Wright	2 00
New Egg Farm	By H. H. Stoddard	1 00
Pocket-Money Poultry	By Myra V. Norys	50
The Diseases of Poultry.....	By D. E. Salmon	50
Poultry Craft	By J. H. Robinson	2 00
Poultry Culture	By I. K. Felch	1 50

HORTICULTURE.

Insects Injurious to Vegetation..	By Dr. W. Saunders	2 00
Vegetable Gardening	By S. B. Green	1 25
Garden Making	By L. H. Bailey	1 00
The Nursery Book	By L. H. Bailey	1 00
Horticulturist's Rule Book.....	By L. H. Bailey	75
The Principles of Fruit Growing...	By L. H. Bailey	1 25
Landscape Gardening.....	By F. A. Waugh	50
The Spraying of Plants.....	By E. G. Lodeman	1 00
Ginseng—Its Culture and Value		35
Outlines of Forestry.....	By E. J. Houston	1 00

APIARY.

The Honeybee	By Langstroth	1 40
Manual of the Apiary	By A. J. Cook	1 00

Any of these books will be sent from the office of The Nor-West Farmer on receipt of the price.

LIBERAL OFFER TO SUBSCRIBERS.

Present subscribers may secure free as premiums any of the above books by sending us new yearly subscribers to The Nor-West Farmer at the yearly rate of \$1.00 each, according to the following scale :—

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" " " 65 to 1.25 "	2 new subscribers.
" " " 1.25 to 1.75 "	3 new subscribers.
" " " 1.75 to 2.50 "	4 new subscribers.
" " " 2.50 "	5 new subscribers.
" " " 5.00 "	9 new subscribers.

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MEMORANDUM GESTATION TABLE.

(For average duration of pregnancy see next page.)

JANUARY.

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Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
		Mare	Cow	Sow	Ewe
1		Dec. 2	Oct. 8	April 22	May 27
2		3	9	23	28
3		4	10	24	29
4		5	11	25	30
5		6	12	26	31
6		7	13	27	June 1
7		8	14	28	2
8		9	15	29	3
9		10	16	30	4
10	Served	11	17	May 1	5
11		12	18	2	6
12	2 young S. ewe	13	19	3	7
13		14	20	4	8
14	Subsided	15	21	5	9
15		16	22	6	10
16	Born	17	23	7	11
17		18	24	8	12
18		19	25	9	13
19		20	26	10	14
20		21	27	11	15
21		22	28	12	16
22		23	29	13	17
23		24	30	14	18
24		25	31	15	19
25		Nov. 1	16	20	
26		27	2	17	21
27		28	3	18	22
28		29	4	19	23
29		30	5	20	24
30		31	6	21	25
31		Jan. 1	7	22	26

Things Worth Knowing.

AVERAGE DURATION OF PREGNANCY.

Mares—337 days. Extremes—307 and 412 days.
 Cows—282 days. Extremes—264 and 306 days.
 Ewes and Goats—148 days. Extremes—146 and 157 days.
 Sows—118 days. Extremes—109 and 133 days.
 Bitches—63 to 65 days.
 Cats—46 to 60 days.

FEBRUARY.

Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
		Mare	Cow	Sow	Ewe
1	Jan.	Nov.	May	June
2	2	8	23	27
3	3	9	24	28
4	4	10	25	29
5	5	11	26	30
6	6	12	27	July 1
7	7	13	28	2
8	8	14	29	3
9	9	15	30	4
10	10	16	31	5
11	11	17	June 1	6
12	12	18	2	7
13	13	19	3	8
14	14	20	4	9
15	15	21	5	10
16	16	22	6	11
17	1543	17	23	7	12
18	TAMWORTH	18	24	8	13
19	Robinsons B.	19	25	9	14
20	20	26	10	15
21	oldest sow	21	27	11	16
22	22	28	12	17
23	23	29	13	18
24	24	30	14	19
25	25	Dec. 1	15	20
26	26	2	16	21
27	27	3	17	22
28	28	4	18	23
29	29	5	19	24

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MARCH.

Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
		Mare	Cow	Sow	Ewe
1	Jan. 30	Dec. 6	June 20	July 25
2	31	7	21	26
3	Feb. 1	8	22	27
4	2	9	23	28
5	3	10	24	29
6	4	11	25	30
7	5	12	26	31
8	6	13	27	Aug. 1
9	7	14	28	2
10	8	15	29	3
11	9	16	30	4
12	10	17	July 1	5
13	11	18	2	6
14	12	19	3	7
15	13	20	4	8
16	14	21	5	9
17	15	22	6	10
18	16	23	7	11
19	17	24	8	12
20	18	25	9	13
21	19	26	10	14
22	20	27	11	15
23	21	28	12	16
24	22	29	13	17
25	23	30	14	18
26	24	31	15	19
27	Jan. 1	16	20	
28	26	2	17	21
29	27	3	18	22
30	28	4	19	23
31	Mar. 1	5	20	24

AL IS DUE.

Sow Ewe

May June

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25 29

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27 July 1

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6 11

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APRIL.

Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
		Mare	Cow	Sow	Ewe
1	Mar. 2	Jan. 6	July 21	Aug. 25
2	3	7	22	26
3	4	8	23	27
4	5	9	24	28
5	6	10	25	29
6	7	11	26	30
7	8	12	27	31
8	9	13	28	Sept. 1
9	10	14	29	2
10	11	15	30	3
11	12	16	31	4
12	13	17	Aug. 1	5
13	14	18	2	6
14	15	19	3	7
15	16	20	4	8
16	17	21	5	9
17	18	22	6	10
18	19	23	7	11
19	20	24	8	12
20	21	25	9	13
21	22	26	10	14
22	23	27	11	15
23	24	28	12	16
24	25	29	13	17
25	26	30	14	18
26	27	31	15	19
27	28	Feb. 1	16	20
28	29	2	17	21
29	30	3	18	22
30	31	4	19	23

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MAY.

DUE. Ewe	Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
			Mare	Cow	Sow	Ewe
Aug. 25	1	.....	April 1	Feb. 5	Aug. 20	Sept. 24
26	2	.....	2	6	21	25
27	3	.....	3	7	22	26
28	4	.....	4	8	23	27
29	5	.....	5	9	24	28
30	6	Young cow 2	6	10	25	29
31	7	D. W.	7	11	26	30
Sept. 1	8	.....	8	12	27	Oct. 1
2	9	.....	9	13	28	2
3	10	.....	10	14	29	3
4	11	.....	11	15	30	4
5	12	.....	12	16	31	5
6	13	.....	13	17	Sept. 1	6
7	14	.....	14	18	2	7
8	15	.....	15	19	3	8
9	16	.....	16	20	4	9
10	17	.....	17	21	5	10
11	18	.....	18	22	6	11
12	19	.....	19	23	7	12
13	20	.....	20	24	8	13
14	21	.....	21	25	9	14
15	22	.....	22	26	10	15
16	23	.....	23	27	11	16
17	24	.....	24	28	12	17
18	25	.....	25	Mar. 1	13	18
19	26	.....	26	2	14	19
20	27	.....	27	3	15	20
21	28	.....	28	4	16	21
22	29	.....	29	5	17	22
23	30	.....	30	6	18	23
24	31	.....	May 1	7	19	24

JUNE.

Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
		Mare	Cow	Sow	Ewe
1	May 2	Mar. 8	Sept. 20	Oct. 25
2	3	9	21	26
3	4	10	22	27
4	5	11	23	28
5	6	12	24	29
6	7	13	25	30
7	8	14	26	31
8	9	15	27	Nov. 1
9	10	16	28	2
10	11	17	29	3
11	12	18	30	4
12	13	19	Oct. 1	5
13	14	20	2	6
14	15	21	3	7
15	16	22	4	8
16	17	23	5	9
17	18	24	6	10
18	19	25	7	11
19	20	26	8	12
20	21	27	9	13
21	22	28	10	14
22	23	29	11	15
23	24	30	12	16
24	25	31	13	17
25	26	April 1	14	18
26	27	2	15	19
27	28	3	16	20
28	29	4	17	21
29	30	5	18	22
30	31	6	19	23

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JULY.

DUE.	Ewe	Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
				Mare	Cow	Sow	Ewe
Oct.		1	.....	June 1	April 7	Oct. 20	Nov. 24
25		2	.....	2	8	21	25
26		3	.....	3	9	22	26
27		4	.....	4	10	23	27
28		5	.....	5	11	24	28
29		6	.....	6	12	25	29
30		7	.....	7	13	26	30
31		8	.....	8	14	27	Dec. 1
Nov.		9	.....	9	15	28	2
1		10	.....	10	16	29	3
2		11	.....	11	17	30	4
3		12	.....	12	18	31	5
4		13	.....	13	19	Nov. 1	6
5		14	.....	14	20	2	7
6		15	.....	15	21	3	8
7		16	.....	16	22	4	9
8		17	.....	17	23	5	10
9		18	.....	18	24	6	11
10		19	.....	19	25	7	12
11		20	.....	20	26	8	13
12		21	.....	21	27	9	14
13		22	.....	22	28	10	15
14		23	.....	23	29	11	16
15		24	.....	24	30	12	17
16		25	.....	25	May 1	13	18
17		26	.....	26	2	14	19
18		27	.....	27	3	15	20
19		28	.....	28	4	16	21
20		29	.....	29	5	17	22
21		30	.....	30	6	18	23
22		31	.....	July 1	7	19	24

AUGUST.

Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
		Mare	Cow	Sow	Ewe
1	July 2	May 8	Nov. 20	Dec. 25
2	3	9	21	26
3	4	10	22	27
4	5	11	23	28
5	6	12	24	29
6	7	13	25	30
7	8	14	26	31
8	9	15	27	Jan. 1
9	10	16	28	2
10	11	17	29	3
11	12	18	30	4
12	13	19	Dec. 1	5
13	14	20	2	6
14	15	21	3	7
15	16	22	4	8
16	17	23	5	9
17	18	24	6	10
18	19	25	7	11
19	20	26	8	12
20	21	27	9	13
21	22	28	10	14
22	23	29	11	15
23	24	30	12	16
24	25	31	13	17
25	26	June 1	14	18
26	27	2	15	19
27	28	3	16	20
28	29	4	17	21
29	30	5	18	22
30	31	6	19	23
31	Aug. 1	7	20	24

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SEPTEMBER.

DUE.	Ewe	Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
				Mare	Cow	Sow	Ewe
Dec.		1	.....	Aug.	June	Dec.	Jan.
25		2	.....	2	8	21	25
26		3	.....	3	9	22	26
27		4	.....	4	10	23	27
28		5	.....	5	11	24	28
29		6	.....	6	12	25	29
30		7	.....	7	13	26	30
31		8	.....	8	14	27	31
Jan.		9	.....	9	15	28	Feb.
1		10	.....	10	16	29	1
2		11	.....	11	17	30	2
3		12	.....	12	18	31	3
4		13	.....	13	19	Jan.	4
5		14	.....	14	20	1	5
6		15	.....	15	21	2	6
7		16	.....	16	22	3	7
8		17	.....	17	23	4	8
9		18	.....	18	24	5	9
10		19	.....	19	25	6	10
11		20	.....	20	26	7	11
12		21	.....	21	27	8	12
13		22	.....	22	28	9	13
14		23	.....	23	29	10	14
15		24	.....	24	30	11	15
16		25	.....	25	July	12	16
17		26	.....	26	1	13	17
18		27	.....	27	2	14	18
19		28	.....	28	3	15	19
20		29	.....	29	4	16	20
21		30	.....	30	5	17	21
22		31	.....	31	6	18	22
23				7	19	23

OCTOBER.

Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
		Mare	Cow	Sow	Swine
1	Sept. 1	July 8	Jan. 20	Feb. 24
2	2	9	21	25
3	3	10	22	26
4	4	11	23	27
5	5	12	24	28
6	6	13	25	Mar. 1
7	7	14	26	2
8	8	15	27	3
9	9	16	28	4
10	10	17	29	5
11	11	18	30	6
12	12	19	31	7
13	13	20	Feb. 1	8
14	14	21	2	9
15	15	22	3	10
16	16	23	4	11
17	17	24	5	12
18	18	25	6	13
19	19	26	7	14
20	20	27	8	15
21	21	28	9	16
22	22	29	10	17
23	23	30	11	18
24	24	31	12	19
25	25	Aug. 1	13	20
26	26	2	14	21
27	27	3	15	22
28	28	4	16	23
29	29	5	17	24
30	30	6	18	25
31	Oct. 1	7	19	26

NOVEMBER.

ANIMAL IS DUE.

Sow	Ewe
Jan. 20	Feb. 24
21	25
22	26
23	27
24	28
25	Mar. 1
26	2
27	3
28	4
29	5
30	6
31	7
Feb. 1	8
2	9
3	10
4	11
5	12
6	13
7	14
8	15
9	16
10	17
11	18
12	19
13	20
14	21
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16	23
17	24
18	25
19	26

Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
		Mare	Cow	Sow	Ewe
1	Oct. 2	Aug. 8	Feb. 20	Mar. 27
2	3	9	21	28
3	4	10	22	29
4	5	11	23	30
5	6	12	24	31
6	7	13	25	April 1
7	8	14	26	2
8	9	15	27	3
9	10	16	28	4
10	11	17	Mar. 1	5
11	12	18	2	6
12	13	19	3	7
13	14	20	4	8
14	15	21	5	9
15	16	22	6	10
16	17	23	7	11
17	18	24	8	12
18	19	25	9	13
19	20	26	10	14
20	21	27	11	15
21	22	28	12	16
22	23	29	13	17
23	24	30	14	18
24	25	31	15	19
25	26	Sept. 1	16	20
26	27	2	17	21
27	28	3	18	22
28	29	4	19	23
29	30	5	20	24
30	31	6	21	25

DECEMBER.

Date of Service.	NAME OF ANIMAL SERVED.	DATE ANIMAL IS DUE.			
		Mare	Cow	Sow	Ewe
1	Nov. 1	Sept. 7	Mar. 22	April 26
2	2	8	23	27
3	3	9	24	28
4	4	10	25	29
5	5	11	26	30
6	6	12	27	May 1
7	7	13	28	2
8	8	14	29	3
9	9	15	30	4
10	10	16	31	5
11	11	17	April 1	6
12	12	18	2	7
13	13	19	3	8
14	14	20	4	9
15	15	21	5	10
16	16	22	6	11
17	17	23	7	12
18	18	24	8	13
19	19	25	9	14
20	20	26	10	15
21	21	27	11	16
22	22	28	12	17
23	23	29	13	18
24	24	30	14	19
25	25	Oct. 1	15	20
26	26	2	16	21
27	27	3	17	22
28	28	4	18	23
29	29	5	19	24
30	30	6	20	25
31	Dec. 1	7	21	26

A FLEA IN YOUR EAR!!

If you are a reader of the Nor'-West Farmer we wish (to use a homely phrase) "to put a flea in your ear." The continued and increased success of that paper means better service to its readers—it means better service to you

**What we
Wish to do**

We wish to keep in touch with everything of interest to the farmer, the rancher, the breeder, the dairyman, the fruit raiser, and—oh, yes! bless your soul, we must not forget them—why, the ladies!

**We
Have
Now**

We have now a connection with the various institutions which form the centres of our social and industrial life. Our correspondence is extensive also from men in the front rank of the world's battles, so to speak—the farmers and ranchers all over Manitoba and the North West Territories.

**We're
Never
Satisfied**

Despite our past success we are not satisfied. "Strange!" you say. Perhaps it is, but it is a fact none the less. "The west" seems to be synonymous with aggressiveness, and perhaps that's the reason why a western printed farm paper simply must be at the top of the tree.

**What
You
Can
Do**

Now we have got to the point. Well, you can help us greatly by sending us a letter once in awhile (it need not be long) giving facts and points from your experience, any interesting observations, original or useful devices for use on the farm or ranch. If a few hundred more help us in that way, it will make a difference in the paper of which you little dream. Help given us returns many thousand fold to our readers.

**A Word
to the
Ladies**

We have a household department in the Nor'-West Farmer. Of course we know you read it,—every lady should. We always feel pleased to receive from any of our lady readers a good, sensible, serviceable letter on any household subject. It may be a well-tryed receipt, a handy way of working, a discussion of social or domestic matters, or, in fact, a contribution on any of the many things which lie near to the womanly heart.

**Will our Readers Help?
We Think They Will!**

THE NOR'-WEST FARMER,

Box 1310

WINNIPEG, MANITOBA.

What is said about The Farmer in the East.

Ottawa, Ont., July 23, 1900.
The Nor'-West Farmer,
Winnipeg, Man.

Gentlemen—The diversified nature of the articles and the careful way in which the different items are arranged, should persuade many farmers that The Nor'-West Farmer is indispensable to their progress and prosperity. During my recent trip through the West I heard many complimentary remarks about your magazine.

Yours very truly,
JAS. FLETCHER,
Dom. Entomologist and Botanist.

Ottawa, Ont., July 18, 1900.
The Nor'-West Farmer,
Winnipeg, Man.

Dear Sirs—In the character of the articles and the quality of the illustrations The Nor'-West Farmer is a highly creditable publication. I think your company, your subscribers, your advertising patrons and those interested in agriculture in the Northwest generally are to be congratulated.

Yours very truly,
JAS. W. ROBERTSON,
Commissioner of Agriculture.



THE NOR'-WEST FARMER OFFICES,
STOVEL BUILDING, WINNIPEG.
Corner McDermot, Arthur and King Streets.

What is said about The Farmer in the South.

Brookings, S.D., July 19, 1900
The Nor'-West Farmer,
Winnipeg, Man.

Dear Sirs—Without doubt The Nor'-West Farmer is a credit to the whole Northwest. Allow me to congratulate you on the noteworthy exhibition of pluck and business ability.

Very sincerely,
JAS. H. SHEPARD,
Director U.S. Experiment Station

Great Falls, Mont.,
August 16, 1900.

The Nor'-West Farmer,
Winnipeg, Man.

Dear Sirs—I can safely say that The Nor'-West Farmer is the best farmers' paper I have ever seen, and is a great credit to the publishers and the British Empire, and as a British subject I am proud of it. Sincerely yours,

B. M. THOMAS.

We all know what is said about The Farmer in the West

